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approach

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Safety and Command RESPONSIBILITY

By CAPT Frank Ault, USN

I AM SURE that none of us in positions of command have the slightest doubt as to the official assignment of responsibility for the safety records of our organizations. The real problem is the means to be employed to achieve the end. Most of us are probably like the young sheik whose father, the sultan, gave him a harem for his birthday; we know what's expected of us . . . but we're not quite sure where to start. Today, then, I will cite a few of the starting places I've found useful in the hope that you may find my observations of value in optimizing your own safety records.

Most of us do the big, obvious things. This is quite apparent when we look through the report of any AdMat inspection and find that we've met most of the basic requirements. Most of us are prone, in the discharge of our command functions, to cover a subject once (or issue an order) and assume that our status as commanders automatically ensures that the job will be done. Most of us dislike repetition. Most of us like to feel that our positions in the "driver's seat" – achieved with no little struggle – have at long last freed us from the mundane details of daily routine and finally have afforded the time and perspective we need to concentrate on the "big picture."

But if you appoint a safety officer, write a squadron SOP, pass out orders to your department heads, require each pilot to be NATOPS qualified and to read and initial all directives applicable to his airplane and then sit back and await results, they probably won't be long in coming – in the form of a crash. Bad luck? Perhaps. It is much more likely, however, that you failed to recognize

that if there is one single, significant key to success in the supervision of your safety program it is meticulous attention to detail, backed by constant repetition of any point which, from your observations, appears to have been either forgotten or ignored. To illustrate: All of you are conversant with current requirements for personal gear to be worn or carried while operating aircraft. At one time or another every pilot has read your SOP on this subject and has read and initialed the directives of higher authority in this area. But when did you last require all pilots to fall-in for inspection dressed and equipped as if for flight and then followup with an inspection of the remainder of the gear in their lockers to ensure it was usable, effective and up-to-date?

Unfortunately, many people tend to treat safety either as a separate subject or as a prime objective of the operation rather than a byproduct. It is my contention that safe operations evolve automatically from establishing how a thing can best be done, insisting that it be done that way and *checking to see* that it is. Standardization implies that only the best techniques (operational, maintenance or other) have been selected. Followup ensures that they are being used. Without standardization you don't even have a bench mark with which to measure performance. But don't stagnate – a better mousetrap may be invented. Be alert to possible improvements and don't be too pig-headed to accept better ideas than your own. *Draw on talent at any level. Never be too proud to ask the man who has the dope.*

Here, command with its broader perspective can do another job by examining activity in all related areas and instigating changes where performance can be amended or improved. Too often we become so immersed in inter-squadron, inter-air group or inter-ship competition (friendly and otherwise) – or we become so enamored of the idea of "making our mark" on our own – that we are blinded to methodology or niceties of technique displayed right next door which we could well use to sharpen up our own operation. Moreover, we often "compound the felony" by developing a good idea on our own and then keeping it a secret for reasons ranging from pure failure to pass the word to an occasional fear that the other outfits will catch up. It is in cases such as these that a commander, such as a CAG, can do a better job by maintaining his objectivity and ensuring that good ideas are sorted out and given the widest possible application. A possible example of this might be a replacement air group where one squadron insists that familiarization students can best be taught landing techniques by stationing an LSO on the runway for talkdowns during familiarization landings, while one or more other RAG squadrons uses an instructor to fly a close wing on the student all the way around the landing

pattern, through touchdown. It is clearly the job of the group commander to determine which, if either, of these techniques is superior and to settle only for the best throughout his air group.

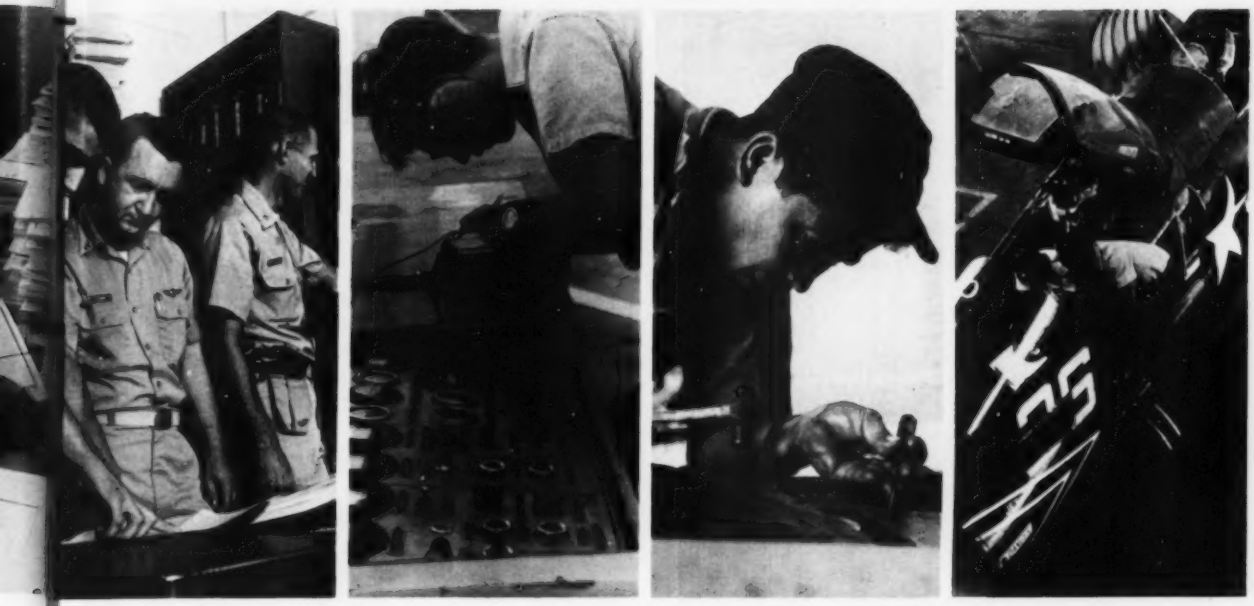
It goes without saying that you can't command unless your know your aircraft and its capabilities and are a fair hand at demonstrating that you do. Equally important, however, is the *ability to transmit what you know*. One of the worst safety records I've ever witnessed came in a jet squadron quite a few years ago where the squadron commander was an ex-Blue Angel and his X.O. was a test pilot school graduate. It was a rare day when either of these gents did less than riddle the banner in gunnery – or did anything else airborne in other than the outstanding category. Yet the fatality rate in this squadron exceeded the total of all other outfits in the area. I cannot help but think that what these people knew about flying simply was not being received at the "Indian" level. This type of leadership of the "out in front" variety, with never a look in the rear view mirror to see how the pack is doing, bids fair to dull a little of the personal lustre of any C.O. who can't get the word across.

Personnel error is still the primary cause of accidents. Fortunately, it is the area most susceptible to direct command action. Here the commander's primary tools are education and training, backed by the considered, judicious application of discipline. To realize their effectiveness, however, these tools impose certain prerequisites:

- You must know your people – personally and professionally. This is achieved only by frequent personal observation under as many different conditions as possible.
- You must retain your objectivity. Don't rely on reputation. Even an ex-Blue Angel or a Navy Cross winner must be evaluated in terms of his performance by today's standards. The basic criterion is "here and now in this job, in this aircraft."
- You cannot tolerate mediocrity. Trouble here often stems from a misconception of loyalty. Quite often a squadron commander will defend inferior performance by one of his pilots simply on the grounds that "he's one of my boys." Today's emphasis on professionalism requires sustained high level performance. We need not (and cannot) tolerate anything else.
- You must preach self-reliance, not blind dependence on others. Expect the other man to do his job but don't come apart at the seams if he doesn't. As a carrier air group commander I witnessed several examples on a shakedown cruise where the operation got slightly out of hand at times because of a volatile combination of experienced (possibly occasionally overconfident) pilots and a "green" ship's company. Pilots just recently off an experienced carrier had considerable difficulty in adjusting to the slower pace of a flight deck where 40 percent of the personnel were in the initial stages of learning. We were fair game for flight deck accidents of just about any description until we realized that some of the slack could be taken up by reemphasis of the pilot's responsibility for his aircraft and the abandonment of habit patterns which had placed undue emphasis on performance by the other fellow. Once this was done, we were ready to develop the teamwork which was in satisfying evidence by the time the shakedown cruise had ended.

Another common pilot failing noted during our shipboard operations – often noted elsewhere over the years – was the reluctance or inability of pilots to take charge in cases of airborne emergencies. Too often a call would come from the aircraft involved stating such things as: "I have a sump light," "I have a rough running engine" or "My oil pressure is falling" with *no statement of intentions or desires*. Pilots must be drilled and drilled again until they understand that decision rests with the man in the cockpit who, better than anyone else within UHF range, knows the exact nature of his troubles and what he is capable of doing about them. The time inevitably comes when the voice of command is not available on UHF and the pilot must think for himself – whether or not he smokes that well-known brand.

Earlier, I took brief notice of the word "discipline" as



it affects your supervisory function, implying that judicious use of discipline, in a punitive sense, was a tool at your disposal. In another accepted connotation of the word, however, "discipline" can mean training – training that develops orderliness and efficiency. Certainly there can be no argument that emphasis on the latter connotation should result in deemphasis of the other. In the area of discipline I think I can best help you by citing a few of the danger signs. If any of the following are in evidence in your organization you have discipline problems:

- Sloppy preflighting.
- Sketchy flight planning or incomplete or inadequate briefing.
- Failure to wear (or carry) prescribed items of personal equipment.
- Incomplete yellow sheets.
- Poor radio discipline.
- Failure to read "all pilots read" materials.
- Delayed or haphazard pilot's weekly inspections.

There are, of course, several other items which could be listed. Examine your own units for trouble spots and get after them.

Many people have searched for years for some single, sweeping change or some major program calculated to reduce the safety problem to manageable proportions. Even the most expansive ideas have achieved only moderate success, however, and none of these can be entirely successful until we fully realize that success lies primarily in meticulous attention to even the smallest detail. Safety is so closely interwoven into every facet of aircraft maintenance and operations that it's impossible to tell where one stops and the other starts. Here are a few examples of seemingly small items which I am sure will have a material effect on the efficiency of your operations, yet unquestionably will affect your safety record as well:

- *Yellow sheet follow-up*: Do your pilots follow up on yellow sheets to find what action was taken on their gripes? If they don't, does your maintenance officer hunt them down and tell them? Here is an opportunity for a "to the point" pilot training program with dividends all around.
- *FOD program*: Does your unit conduct a walkdown of all hangar and line areas for possible FOD prior to commencement of flight operations each day?
- *Briefing*: Do you use a standard briefing checkoff list? Is it readily available in the readyroom? Does the SDO keep it current with weather, PIM and other info? Do you have standard kneepad cards tailored to your briefing format so that items recorded are orderly and complete? Do you fly it the way you brief it?
- *Safety lectures:* Are they divided into basic categories by activity phase? (e.g. taxiing, takeoff, inflight, landing) Are they further subdivided into training phase (gunnery, bombing, etc.) so that proper points are emphasized in timely fashion?
- Do you require your pilots to compute line speeds, deck runs, catapult gross weights and other launch data

or do they depend on other personnel to have the dope and keep them out of trouble?

- Do you have a periodic, written safety quiz and/or an "emergency of the day?"
- Do you walk through your spaces once or twice a day to watch your organization at work and meet your people?
- Do you customarily assign briefing topics to each of your officers for presentation during "All Officers Meetings" or do your AOMs feature monologues by the C.O., X.O. and safety officer?

Before winding this up I feel I should mention one source of personal pique: the so-called "meat axe approach" to safety where the threat of disciplinary action becomes a modern Sword of Damocles held by a fragile thread of whim to be exercised when an accident occurs. I feel that too often during past years the axe has been displayed as a prime method of getting the job done. Naturally, this action at any level carries through to the lowest levels below. You and I were selected for our jobs and our subordinates were selected for theirs, only after being subjected to an intensive, exacting screening process. Let us at least have enough confidence in the screening process up and down the line to permit a man the latitude he needs to solve his problems. The time to use such tools as the disposition board is *before* an accident occurs, not after it. Let's devote our time and energies to perfecting our own operations in the hope that by so doing we may develop the wisdom needed to recognize trouble in its incipient stages.

One final word: how do you know whether you're doing the job you should? If your only measure of performance is your safety record, your mark can only be negative since accidents that don't happen don't hit the record. On the other hand, your failures are plain to see.

The only true evaluation of performance comes from your state of operational readiness – however measured. Almost invariably the highest states of readiness are characterized by low accident rates in those organizations where safety is viewed not as an end – but an inescapable byproduct of a sound doctrine; *formulated* from the best sources of knowledge and experience, *flown* as specified and followed up continuously at every level to the most minute detail.

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Always Engage the Before Actuating

THE FORMER editor of the *"Flying K"* at NAAS Kingsville found himself in a production crisis one week and unable to take time to proofread the paper without missing the press deadline. He knew the paper would be full of errors, so he solved the problem by inserting a little notice that said:

> *We try to have a little something for everyone each week, even those people who spend many hours looking for errors in our paper. For their enjoyment, therefore, we have loaded this issue with mistakes. The person who finds them all will get a drpxip$.*

Most people, not being familiar with the workings of a print shop or the dynamics of magazines and newspapers, don't know the problems involved and thus the cause of errors.

Editors and printers blame most of the typographical mistakes on little insects called type lice.

Type lice are almost microscopic in size but are very stout little fellows. They can move a piece of type as big as a die. They usually shift it into a transposed position or turn it upside down. They also have a prodigious appetite and subsist on various types of metal but they have a sweet tooth for lead and, therefore, hang around print shops and live in typebins.

They are notorious for devouring an entire letter in the middle of a word, thereby deleting the letter completely.

There is no known insecticide to combat these little rapscallions but printers go around their shops once a week and bang on the typebins. This drives the lice toward the bottom of the bin where the Xs and Zs are kept and helps solve the problem temporarily since not many words contain Xs and Zs.

NAS Cecil Field Afterburner

SH-3D Saved

HAPPINESS is a saved aircraft and crew when trouble arises and the pilot not only makes the save but also has the time and sufficient knowledge of the aircraft's systems to pinpoint the trouble.

Prior to liftoff, the HAC (Helicopter Aircraft Commander), who was sitting in the copilot's seat, noticed that the Auto Stab release button on his cyclic would not release the ASE, Bar Alt, coupler and hover trim. The Bar Alt light decreased in intensity when the Auto Stab release button was activated but would not go out. He repeated the check several times until finally the light did go out. A few minutes later, when shifting from accessory drive to the flight position, the ASE and Bar Alt engaged itself and the helicopter tried to jump the chocks due to the marked change in altitude and UP collective signals. The Auto Stab release button was activated, the lights went out and the inputs ceased.

Several automatic approaches were conducted after a routine takeoff and everything was normal. While climbing out after the fifth approach and hover, the fleet replacement pilot, who was flying the helo from the pilot's seat, reported a DOWN load on the collective as he climbed through 120 feet. He could not get the Bar Alt to release. The HAC told the replacement pilot to keep climbing while he attempted to disengage the Bar Alt with the collective channel switch and then the release button on the console ASE panel. No luck. The HAC then tried to secure the ASE using his cyclic Auto Stab release button but also to no avail; so he pulled the overhead primary bus d.c. and ASE circuit breakers which did the trick.

As they were returning to Homebase, the HAC continued further cockpit troubleshooting. He reset the overhead circuit breakers which reengaged the ASE and Bar Alt. He also discovered that the Auto Stab release button would disengage the ASE but when the button was released the ASE and Bar Alt reengaged. The next sequence involved pulling the overhead circuit breakers again but the ASE did not go off. The HAC then directed that the aux servo be secured. This canceled the ASE/Bar Alt inputs and the helicopter was landed at Homebase without further incident.

Investigation revealed a short circuit in the No. 1 and 2 ASE cannon plugs mounted below the pilot's seat. The short circuit was probably caused by water from recent rains leaking into the cockpit through the pilot's hatch. The C.O. reported in his endorsement that attempts to keep water from the ASE and other electrical circuits in the SH-3 have not been effective. All operators of the SH-3 are reminded of this peculiarity in design and must be prepared to cope with ASE malfunctions when the bird has been exposed to heavy rains.

Moisture in and around the cannon plugs of the ASE has been a long standing problem in the SH-3. Various operators have conducted special tests involving windshield sealants to keep the water out, special flaps and shields over the ASE panel to divert rain and spray, different potting compounds and Krylon sprays to try to keep the area waterproof but the problem has yet to be solved satisfactorily. SH-3 operators, stay on guard against short circuits!

NavAirSysCom and Sikorsky engineers are working on this problem. NavSafeCen recently sent a message to NavAirSysCom requesting that increased emphasis be placed on solving the moisture problem in the cannon plugs. – Ed.

Short Snorts

To say the right thing at the right time, keep still most of the time.
Anon.

Look What You Did

THERE was no visible damage but, because rotor RPM limits were exceeded, preventive maintenance required removal and replacement of the main rotor hub, blade retainers, main rotor blades, blade flaps, folding pins, lead-lag pins, tracking actuator assemblies, azimuth rod assemblies, azimuth spindle bearing, tail rotor blade, grip assemblies locking pins.

All this was triggered when two pilots manned a UH-2A for a second test hop. Earlier in the day they had flown the same plane on the first test flight. On the second flight they conducted a cursory preflight, each pilot looking over "his" side. (Bad!) The aircraft commander finished his preflight and strapped in (while the copilot was still looking) and started the engine without using the checklist. The rotor brake was OFF, throttle in FLIGHT IDLE and emergency fuel control in EMERGENCY. He did not go through the formality of checking the emergency throttle operation because he had checked its operation during the first test hop. Rotor engagement was normal and again the checklist was not used as the copilot strapped in. *(Very Bad!)* The pilot began a maximum beep check and as the RPM went above 104 percent he used UP collective and beeped down to prevent an overspeed. The last RPM indication they remember was 109 percent but it was enough to cause the copilot to shift to NORMAL fuel. Then they shut the engine down. After first checking with maintenance and being reassured that an inspection was not required they made another start and completed the test flight. *(Very, very bad!)* Only one gripe was logged – high auto RPM. On the next flight another pilot, during preflight, noted an overspeed indication of 115 percent on the pilot's recorder. The plane was immediately downed and the many, many maintenance man-hours required to get it back in commission began.

Some day there may be a system developed which will permit engine start and rotor engagement of helicopters *only* if all switches and sequencing are correct. Until that day it is mandatory for operators to follow NATOPS procedures and spend those few extra minutes required to utilize the checklist.

How To Spoil . . .

THE Windward Islands are positively beautiful, except when a hurricane is close by. One conjures mental images of these islands and their lush green hills, beautiful sparkling blue water in many hues, white soft sand, swaying palm trees and lovely bikini-clad maidens. Don't forget, however, that the natives who "guide" you into parking spots at the various airports on such islands are not always familiar with helicopter characteristics, blade clearances and rotor wash. One helicopter pilot did forget the latter and, while under the direction of a civilian taxi director, ran into a parked aircraft.

Fortunately, there were no personnel injuries but, in addition to a damaged ego, several rotor blades were broken.

Always be alert when following taxi signals, especially when visiting a strange field or a field with taxi directors who are not familiar with your aircraft or modes of operation.

Aviators *must* beware of the tendency to drop their alertness guard as soon as the wheels touch the deck. The flight is *never* over until the aircraft is completely secured in the chocks.

Poor Headwork

AFTER engine runups, an EA-6A pilot brought both engines to IDLE and then began his takeoff roll by advancing power levers from the idle position. As he accelerated, he noticed that the aircraft had traveled further than the lead aircraft's liftoff point without attaining flying speed. Noting that

he had only 120 knots but still had 4000 feet of runway remaining, the pilot decided to abort his takeoff. He applied brakes but released them as he crossed the cable for the E-28 arresting gear. As the brakes were reapplied they began to fade. The pilot lowered the hook and picked up the abort chain gear at the end of the runway. The aircraft then rolled 423 feet into the overrun area but was not damaged.

With a maximum allowable acceleration time of 11 seconds from IDLE to 100 percent rpm, the pilot should have understood that by starting his takeoff roll from idle power his airspeed would be less at any given point on the runway than the airspeed of the lead aircraft, which started its takeoff with 100 percent rpm. In addition, the pilot erred in believing that he could stop the 56,000-pound aircraft from 120 knots with less than 4000 feet of runway remaining. In so doing, he failed to take advantage of the E-28 arresting gear which was available to him 2500 feet from the end of the runway.

This incident could have been avoided by better planning and headwork.

You'll Get A Bang Out of This!

PREFLIGHT disclosed no discrepancies on the A-4E, so the pilot climbed aboard, strapped in and fired up. Everything seemed O.K. so he taxied to the takeoff end of the duty runway, applied power and commenced the takeoff roll. The first indication that all was not routine was an indication of nosewheel vibration at approximately 125 knots. However, liftoff went as advertised. While climbing out, the pilot requested a visual check of his nose gear by another aircraft in the section. The check revealed that his nose tire was missing except for the beads. The pilot made a short field arrested landing, complicated only by dust being blown over the approach end of the runway by the SAR helo. Tire failure had been caused by improper inflation.

Investigation revealed that flight line personnel had been using a length of hose which had a pressure remote control safety gage assembly between the nitrogen bottle and the tire. One end of the hose had a quick disconnect fitting which required a tire valve adapter. The core of the adapter had been removed due to previously faulty cores causing loss of pressure from the tire when the adapter was installed. When pressure was read on the remote gage assembly with the adapter core removed, the resultant indication was only of the pressure "trapped" in the line between the gage and the tire, vice true tire pressure. QA personnel should always insure that proper procedures are followed when utilizing tire inflation equipment.

E-2A Improper Landing Technique

ON ROLLOUT following a GCA, the E-2A started a right drift at 60 – 70 knots. The pilot attempted to straighten the aircraft with full left rudder and nosewheel steering but with no effect. The power levers were in the ground idle range because the pilot had been unable to place them in the reverse range. Nosewheel steering was released and power was added on the starboard engine just as the port engine went into reverse. The aircraft swerved left and the port main mount tire blew. Both pilot and copilot put in right rudder as the pilot added power on the port engine and resumed nosewheel steering. The E-2A was stopped with no further difficulty.

This incident resulted from improper pilot landing technique. Although the pilot had a 50-degree crosswind from the left at 20 knots, it was felt that the primary cause of the incident was improper use of nosewheel steering. The normal tendency is to utilize nosewheel steering to correct for rollout swerves but above 50 knots nosewheel steering response is erratic due to light vertical loads on the nosewheel. Correct technique is to control rollout direction with rudder and differential power. The pilot in this case was aware of the correct procedures but because of the unexpected directional swerve he reached for the nosewheel steering.

In his comments the commanding officer recommended that E-2 commands consider periodic landing practice with the nosewheel steering locked out in order to stress to pilots that reliance on nosewheel steering for anything other than taxiing is unnecessary and unfounded.

Don't Be Bashful About Declaring An Emergency

An Anymouse Special

IT WAS my time of the year to attend the instrument refresher course at the local instrument RAG. The syllabus consisted of four flights, all of which were to be used in practical application to airways flight and a review of easily forgotten instrument procedures (ADF, DF, NORDO, etc.).

For my last flight of the syllabus I had planned one of the "canned" APC flights the squadron recommends. After the usual briefing, touching the highlights of the flight, we manned a TA-4F. Because of some difficulties, we remained in the chocks for almost an hour as troubleshooters worked on the aircraft. After the minor repairs were made and the instructor made the decision to go, I obtained my ATC clearance. The flight commenced as briefed and the route was flown without incident.

Some 50 miles out, on the final leg home, the instructor informed me not to be alarmed, that he was going to dump some fuel. He then proceeded to dump to just under 3000 pounds.

Our tacan penetration and first GCA were progressing normally. On final, however, my instructor informed me that we would be making a couple of more GCAs since we were already late and "might as well get 'em in."

Although the flight was briefed as a day flight it was just about dark due to our delay in the chocks. I was under the bag all this time and had only the weather reports of the approach controllers for weather condition information. It turned out that a perfectly beautiful VFR night was about to go as IFR as possible.

On the downwind leg of our second GCA we were informed that wind warnings were going into effect and that blowing dust was expected. It was because of these warnings that most of the aircraft in the area were returning to home base. This extra traffic accounted for our extended downwind legs (28 miles). The second GCA went as did the first, although I noticed somewhat more turbulence and the weather was now reported as being IFR. During the turn to base leg, I noted the fuel gage at 1700 pounds. The instructor told me that we had enough for a few more approaches.

Our downwind leg was a carbon of the first with the extension and "S" turns used for spacing. The wind at this time was reported at 20-25 knots gusting and was by no means down the runway. Because of the difficulty in controlling the aircraft in this turbulence, my scan did not include the fuel indicator. It was not until the tower cleared us for a "low approach" rather than a "cleared to land," that I looked down at the fuel gage and blurted out that we had "only 600 pounds" remaining. I explained to the tower (all this time under the hood) that I had requested and was requesting a full stop landing. They told us to "Standby."

By this time we were approaching the threshold lights. As we passed the lights and continued up the runway, the instructor took the aircraft and radios and I popped the bag. He asked the tower once again for clearance to land. The weather at this time was one-half mile visibility in blowing sand and with the same gusty winds. The tower was not in view and only the high intensity runway lights could be seen. The instructor continued to fly down the 13,000-foot long runway in hopes the tower would allow us to land before we proceeded too much farther.

At this point I took command of the radios and tried contacting the tower again. After several futile attempts, and well past the point of being able to land on that pass, the tower told us, "the field is IFR, contact approach control on 243.8." The instructor switched frequencies and started a turn downwind. Although the runway was badly obscured, we could still see the somewhat eerie illumination of the runway lights. After several attempts to contact approach control, they advised us of our position and asked us of our intentions. It was at this point that my instructor informed them that our fuel was low (525 pounds) and that we were requesting an immediate landing.

Approach control asked us if we were declaring an emergency. My instructor replied that we were not but that we wanted an immediate clearance to land. They told us to "Standby," that there was other traffic on final and we would have to be extended downwind.

At this point, I took off my kneeboard, cleaned up the back cockpit and positioned the face curtain and myself for the seemingly unavoidable outcome.

Instead of waiting for approach control to reply, my instructor switched to tower frequency and declared an emergency. We were cleared to land. Although the runway was still not discernible, the high intensity

strobe lights were in view off our left wing as we turned onto base leg.

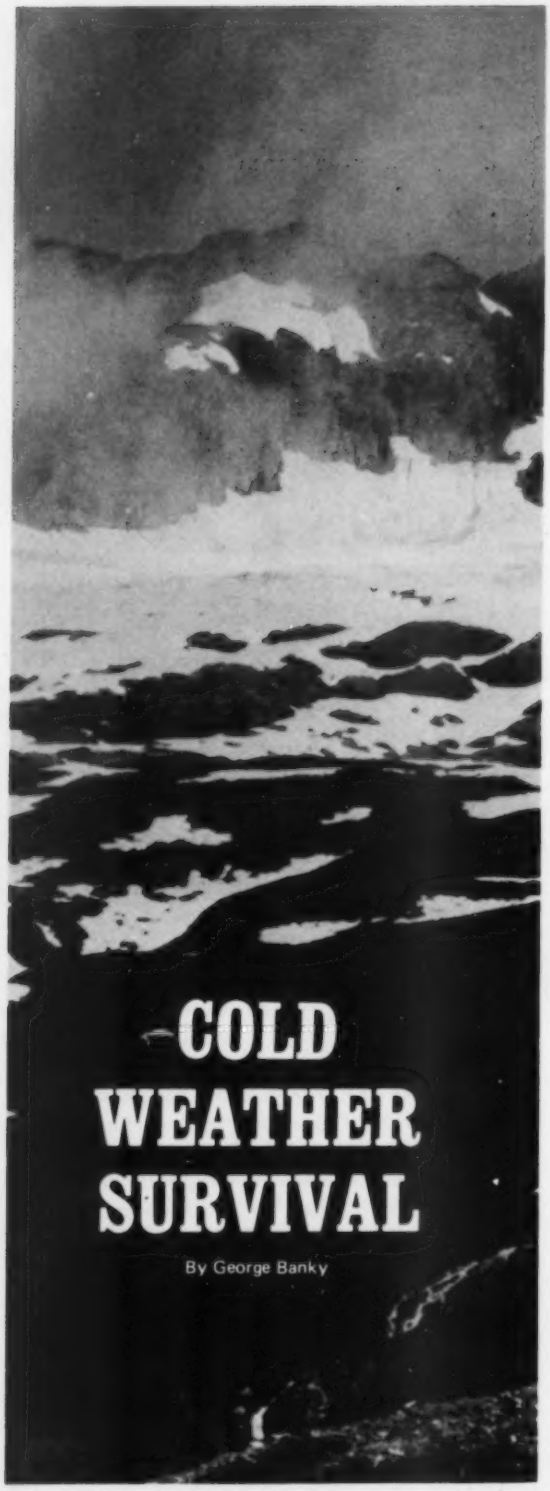
The landing was a bit rough and a bit fast and we taxied into the line without further incident. Just before shutdown, I noted the fuel gage indication with a sweaty gulp.

Low Fuel Anymouse

The instructor pilot obviously let his desire to "get in a few more approaches" override his good judgment. When it became apparent that the field was about to go IFR and the traffic pattern was saturated due to many aircraft returning to the field, the instructor should have recognized the changed situation and called for a final landing before fuel became critical. After the fuel state did become critical, he was reluctant to declare an emergency. Where was Prudence?

Pilots must plan ahead in order to prevent an emergency situation from arising. However, when an emergency does exist, there should be absolutely no hesitation in letting the appropriate controlling agencies know about it. It's far better to risk a degree of embarrassment on the deck than it is to let the situation continue to deteriorate until a crash is inevitable.

Anymouse may have been an unnecessarily passive participant in this flight. Although he was not the pilot in command, there is no good reason why he should not have offered the pilot in command some good advice during the time this emergency was developing. Take Prudence on every flight. ◄



COLD WEATHER SURVIVAL

By George Banky

THE ONLY heating plant you are sure to have with you in a cold weather survival situation is your body. To what degree you feel cold depends mainly on how well your body is protected. Knowing how to conserve body heat through use of protective clothing may very well mean the difference between freezing to death and surviving.

The first and most important step in cold weather survival is to *always* dress for the coldest weather you are likely to encounter during your flight before you take off. The second step is to give some thought to what equipment is available and what personal survival equipment you will carry for adaptation to type aircraft and area of operation. The third step which applies once a survival situation is an actuality is to use your imagination and maintain a positive mental attitude.

Protective clothing: Choosing protective clothing to wear is not difficult. "Long John" thermal underwear is readily available and is a must. As *Personal/Survival Equipment Crossfeed 10-69* points out, "Like it or not, the best available anti-exposure coverall for all-around protection is the Mk-5A." Clothing and Survival Equipment Bulletin 10 gives complete information concerning the Mk-5A anti-exposure suit. The next best choice is the Air Force CWU-1P winter coverall, available through normal supply channels. CSEB 19 gives complete description and use of this type of coverall.

Imagine now that you are in a particular survival situation – an ejection followed by a parachute landing in snow. Your equipment is what you have with you after seat/man separation.

Generally these basic rules apply:

- Get a fire started as quickly as possible for warmth and an uplifting of the spirits.
- Rig a shelter.
- Inventory your equipment.
- Consider food and water.

Firemaking: Firemaking is a subject all by itself which we won't detail here. You have waterproof matches, a candle, flint and fire starter sheets in your SEEK kits.

Shelter: Scoop out a snow hole or snow trench. (Figs. 1-3.) Inflate and invert your LR-1 (PK-2) liferaft and place it in the bottom of your shelter for an insulating mattress. Place your parachute across your shelter, anchor it with snow and leave an opening for ventilation. The inside temperature of your shelter, not including body heat, is approximately 18°F. warmer than the outside temperature. You can expect an additional 10°F. from your body heat. *Caution – You can be asphyxiated from your own breathing.* In rigging your shelter, all your movements should be deliberate. Avoid

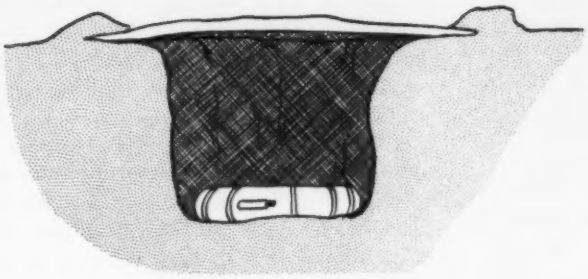


Fig. 1

Cross section view showing snow hole covered with parachute and inflated inverted liferaft for mattress.

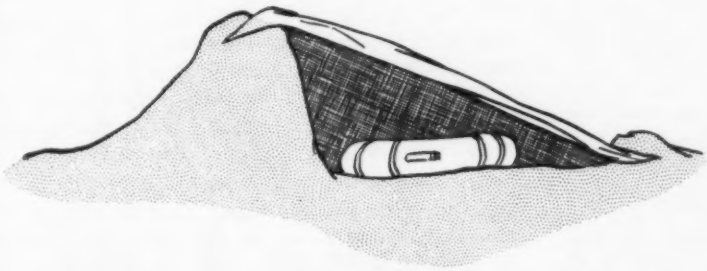


Fig. 2

Cross section showing lean-to type of shelter using inflated inverted liferaft for mattress.

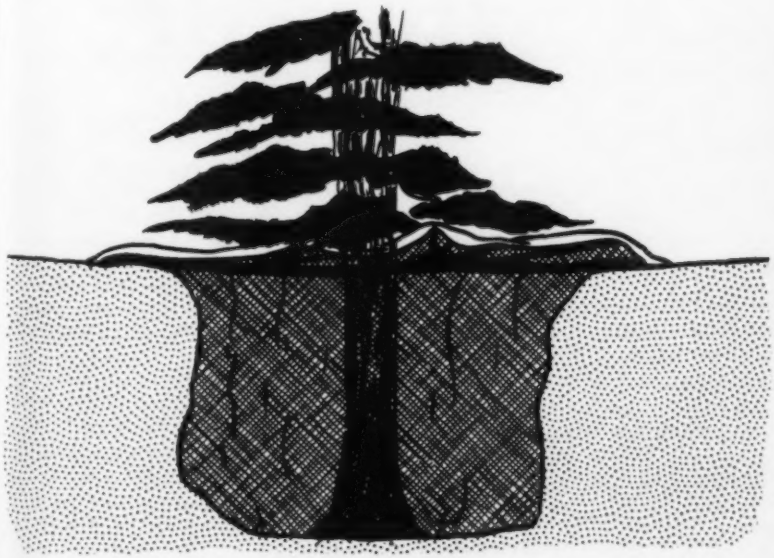


Fig. 3

Cross section view showing snow hole using branches of tree in addition to parachute to cover survival shelter.

sweating. Perspiration can freeze to you, increasing loss of body heat. Slow your pace down or remove some clothing. Try to keep as dry as possible.

Equipment: You have a considerable amount of survival equipment in your survival vest, seat pan and Mk-3C life preserver.

Survival vests should contain the following items:

1. Survival knife
2. Pistol (optional)
3. Radio (PRC-63)
4. Whistle
5. Mk-79 flare kit
6. SEEK kit (Only equipment of immediate concern listed here):
   - fire starter kit
   - candles
   - signal mirror
   - chapstick
   - candy
   - matches
   - saw
   - soup cubes
   - aluminum sheet
7. Optional equipment: could include tea bags, additional soup cubes, book matches, heavy socks, candy bars, etc.

Seat Pan

1. Radio (URT-33) – beacon only.
2. LR-1 (PK-2) liferaft – use for mattress in snow hole.
3. Dye marker and shark chaser – sprinkle on snow for easier sighting by SAR aircraft crews.
4. Mk-13 Mod 0 signal flares.
5. Signal mirror.
6. 50 feet of nylon line – unlimited uses.
7. Candy.

Mk-3C Life Preserver

1. Mk-13 Mod 0 signal flares.
2. Dye marker and shark chaser (one each).

Frostbite: The human body is continually producing and losing heat. Wind increases heat loss by reducing the thin layer of warm air next to your skin. Heat loss increases as wind velocity increases. When the temperature of the air is below freezing (32°F.) and the wind is such that it removes heat faster than your body can replace it, frostbite occurs. Wet clothes, especially gloves and shoes, cause frostbite. The first signs of frostbite are hands and feet, etc., getting white and numb. Take care of them immediately. If your extremities do get frostbitten beyond rewarming, leave them alone until you are rescued. Do *not* rub them with snow and do *not* massage them vigorously. The only prevention of frostbite is exercise of caution before frostbite starts.

Food and Water: Eating snow by itself can make you thirstier than ever, lower your body temperature and make you doubly miserable and more conscious of the cold. Melt the snow and warm it up before drinking. Boiled tea or soup cubes relieve thirst and reduce hunger somewhat. Because snow lacks minerals, it makes you thirstier and it often produces stomach disorders.

Remember, don't fight the elements. If a storm blows up, stay in your shelter, rest and conserve your strength. Sleep will be difficult because of wind or snow blowing against your shelter but most of all because of the appalling cold. You can induce sleep by taking a few mouthfuls of melted, warmed snow and as many calories as possible from your available food supply before retiring.

Be prepared for survival. If you find yourself in such a situation and know what to do, you are halfway home!

References: NavAer 00-80T-56, *Survival Training Guide.*

The Art of Survival by C. C. Troebst, Doubleday and Co., Inc. New York, 1965.

Personal/Survival Equipment Crossfeed 10-69.

The preceding article by George Banky was forwarded by LCDR Frank J. Formeller, MSC, aviation physiologist at NAS Lemoore where Mr. Banky, "out on 20," is an engineering technician. A graduate of Parachute Riggers Class A School and the Oxygen Equipment Course at Lakehurst, N. J., Mr. Banky was attached to VC-5, FASRON 51 and FASRON 104, and served at NAAS Port Isabel, Texas and in USS ESSEX.

Miss Safety Haiku says:

Oh winter wind blowing cold
Your chill dews the breath
And blinds the windowpane.

Dry Ice in Cargo Aircraft

DRY ICE carried aboard an aircraft for the preservation of food or medicines can become a significant hazard to both flight crews and passengers. Although dry ice (solidified CO_2) is not considered a hazardous material by FAR Part 103, there have been commercial aviation incidents in which personnel were overexposed to CO_2 gas liberated from sublimation of dry ice. Sublimation is the process of converting a solid substance (dry ice) into a gas or vapor (CO_2).

Military cargo aircraft occasionally carry dry ice. Although no injuries or incidents have been reported occurring aboard naval aircraft, a potential hazard exists when carrying such cargo.

Packing and handling should conform to the requirements in the interservice publication manual on Packing and Handling of Dangerous Materials for Transportation by Military Aircraft (NAVAIR 15-03-500).

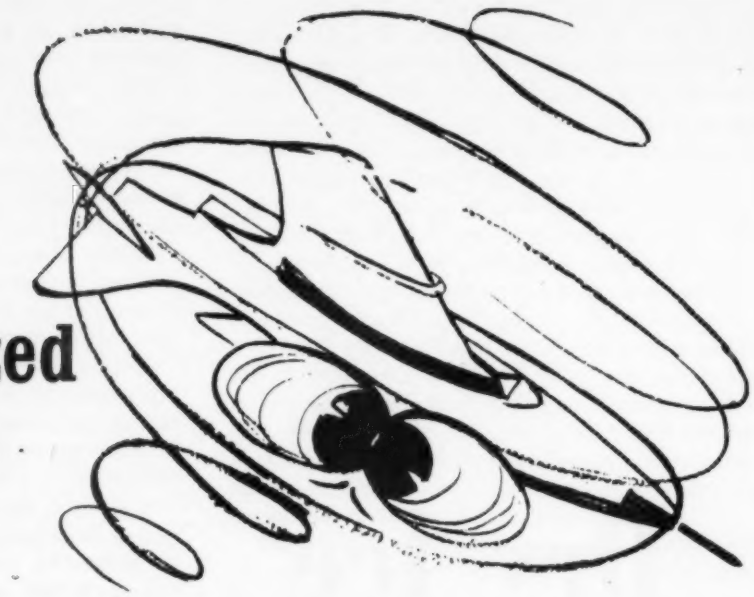
- *Physical hazards and precautions:* Dry ice is formed under tremendous pressure. The pressure created by sublimation inside a sealed container represents an explosive hazard, as it could cause the container to burst. From experience during flight *an evaporation rate of one pound per hundred pounds of dry ice per hour* can be expected. It is imperative that dry ice not be packed in sealed cans or any type of container which will not permit the escaping gas to pass through its walls. *Do not* enclose dry ice in a thermos bottle unless holes are drilled through the thermos stopper. NAVAIR 15-03-500 recommends that dry ice be wrapped in kraft paper, secured with tape and packed in corrugated boxes.

- *Health hazards and precautions:* Dry ice is very cold and can damage skin, mucous membrane and tissue upon contact. If CO_2 concentration in the aircraft exceeds 0.5 percent, crew personnel may suffer shortness of breath. Concentrations of *nine* percent may be fatal in five to 10 minutes. Carbon dioxide is heavier than air; therefore, the heaviest concentration will be at floor level. Crew personnel should be cautioned against lying on the cargo compartment floor or remaining in the cargo compartment for prolonged periods. If symptoms of overexposure are noted, use oxygen and increase ventilation to provide rapid relief.

- *Storage and handling:* Store in a ventilated place. Never store in hermetically sealed containers. To minimize CO_2 concentration while the aircraft is on the ground, open all cargo and access doors for maximum ventilation.

- *Safe loading and ventilation:* The requirements for maximum safe loading in pounds and ventilation needs are listed in NAVAIR 15-03-500, Chapter 11, paragraph 13.

Unauthorized Maneuvers (Cont.)



THE FLIGHT was an instructional four-plane low-level navigation hop. There was an instructor and a student pilot in the lead aircraft. Before calling for takeoff the No. 4 aircraft went down in the warmup area. The No. 2 aircraft had difficulties on the runway, so the instructor pilot made the decision to cancel the launch.

The instructor pilot and student decided to proceed to the local flying area in the TF-9J for some routine high work. After about 30 minutes of maneuvers the instructor pilot advised the student that he was going into a ZERO airspeed, nose-high attitude to demonstrate that recovery is "no sweat" as long as you don't touch the controls and induce a spin. Departure from flight would occur but normal flight should be regained after a couple of uncontrolled turns.

With the aircraft in an extreme nose-high attitude and ZERO airspeed, the nose of the aircraft fell directly through the horizon in a wings level attitude (hammerhead stall) and the nose stopped in what appeared to be an extremely nose-down inverted attitude. At this point a wild ride began. The altitude was 26,000 feet.

Both the instructor pilot and the student were hanging in the straps. After about two turns, the instructor pilot realized that the aircraft was not in what was considered a "routine" departure from flight but was in fact in an inverted spin.

The aircraft probably spun around once more before the instructor pilot determined the direction of spin. The spin was to the right and left rudder was applied. The aircraft rolled upright and immediately entered a spin in the opposite direction. Right rudder was smoothly applied and the aircraft righted itself. Passing 13,000 feet the airspeed was indicating 250 knots, the aircraft was in a slightly inverted position and a steep nose-down attitude. The rest of the recovery was uneventful.

What impressed the instructor pilot most about the spin was that it happened so fast and reaction seemed so slow. There was the feeling that Lady Luck was really responsible for the recovery. The instructor pilot involved vows that he will never drive another jet aircraft into a ZERO airspeed regime.

ZERO Airspeed Mouse

This narrative reads like a copy of one of two incidents recounted on page 14 of the February 1969 APPROACH, in the article entitled "Unauthorized Maneuvers

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The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

REPORT AN INCIDENT, PREVENT AN ACCIDENT

1968/1961." In both these cases an instructor pilot decided to demonstrate a ZERO airspeed recovery in TF-9J aircraft to a student. Inverted spins resulted in both cases. In one case a recovery was effected at 6000 feet (below the minimum recovery altitude specified in NATOPS) and in the other case both pilots ejected when the aircraft passed through 10,000 feet.

The TF-9J and most other aircraft are limited to 10 seconds of inverted flight for two reasons: To prevent oil or fuel starvation. In flying an aircraft straight up to ZERO airspeed there is the possibility that this 10-second limitation will be exceeded, especially if recovery is effected by a ZERO G fall-off in a nose-high inverted attitude. Additionally, if an inverted spin occurs before positive G flight is regained, oil starvation is likely to occur. Likewise the engine may flame out from lack of fuel.

Flying an aircraft into the ZERO airspeed regime is an unauthorized maneuver. In addition to this fact, there is no approved procedure for naval aviators to practice inverted spins in jet aircraft; therefore, good headwork dictates avoiding unnecessary maneuvering in flight regimes likely to result in inverted spins.

A Slight Case of Togetherness

YOU CAN have a mid-air collision, no matter how experienced, competent or cool you are in the air. It can be caused by many things. This ANYMOUSE had one that was caused by a moment's inattention on the part of his wingman. Fortunately it was more of a soft bump than a collision. That's why the ANYMEESE involved are able to relate their lessons learned.

Three pilots rendezvoused their F-8s routinely after night cat shots from ANYBOAT. There was no moon but the sky was clear. Weather was not a problem but haze denied them a usable horizon. Old hand pilot was on the gages leading two first tour/second cruise pilots in a V-formation. No lack of talent or ability in the gaggle.

Shortly after rendezvous, ANYBOAT control asked the flight leader if one of the wingmen could be detached to work with another F-8 on another frequency. Flight Leader said they could have the port wingman, the more experienced of the two available. ANYBOAT control gave the port wingman a vector 90 degrees away from the flight's heading and the flight leader told the wingman to detach. Port wingman banked easily to port – the flight leader saw him turn and start to move away. Then leader went back onto the gages.

A few seconds later leader noticed something in his left peripheral vision and turned his head in time to see the underside of an F-8 intake about 15 feet from his cockpit. Almost simultaneously he felt a soft bump on the airframe. The F-8 peeled off to port and the starboard wingman started yelling "mid-air" on the radio! The flight diverted to a nearby airfield, landed without incident and discovered minor damage to the aircraft involved.

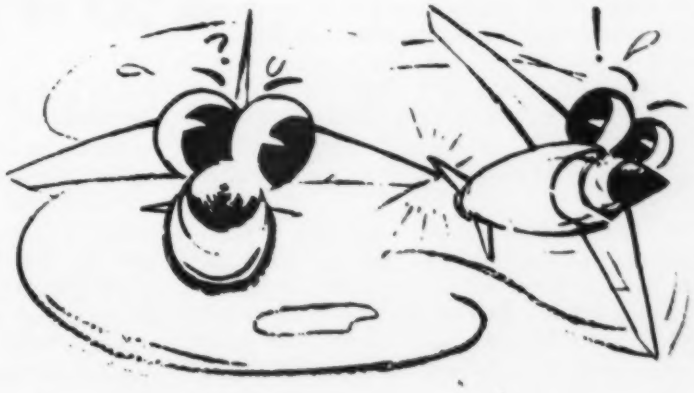
The mid-air was caused by the wingman being momentarily distracted by an unusual aircraft noise as he detached from the leader. After starting his turn and moving away, the wingman went on his gages and concentrated on finding something wrong. He swept the gages from left to right and noticed something outside when he was checking the right side. "Something" was his leader. The port wingman had apparently relaxed his turn and drifted back toward the leader. The bump occurred when the wingman banked and pulled away hard. The wingman's tail clobbered leader's wingtip.

The wingman's momentary distraction prevented him from noticing his drift back to his leader.

Lessons learned? Night flying is inherently more dangerous than day flying and requires constant extra vigilance and adherence to standard procedures. Experience and many hours in the air are not substitutes for alertness and proper action while flying.

Anymouse

Amen! You were indeed fortunate that you escaped with only minor damage to your birds. The saying that, "A mid-air can ruin your whole day!" applies equally to your "whole night!" ◄



A Rash o

A TA-4F pilot engaged nosewheel steering during landing rollout in order to turn left onto a taxiway. As the aircraft turned, it started to tip toward the right wingtip, extending the left main mount oleo. The pilot righted the aircraft and commenced maximum braking which left skid marks from the right wheel for 62 feet and the left wheel for 58 feet. The aircraft stopped with the nosewheel 20 inches short of a taxi light and pointed about 45 degrees left of the runway heading, bisecting the angle formed by the runway and the taxiway.

The field support crew arrived on the scene and signalled the pilot to hold the right brake while they pushed backwards on the left wing in an effort (which proved futile) to rotate the aircraft in order to clear the taxi light. When this failed, the pilot was then directed to taxi around the light, a procedure which placed all three wheels off the taxiway and onto a surface designed for erosion control. This area adjacent to the taxiway failed to support the left main mount and the wheel settled about four inches into the surface. The pilot then shut down the engine, placed the ejection seat safety handle (headknocker) down and exited the aircraft. The aircraft was then towed onto the taxiway by field support personnel and returned to the line without a brake rider.

The commanding officer, commenting on this incident, stated:

"It is fortunate that this aircraft was not damaged since three distinct opportunities for incurring damage existed. The errors of personnel involved, though natural and seemingly innocent enough, compounded each other until the overall situation had, as in most incidents, deteriorated beyond control.

"The pilot erred in judgment by attempting to turn off the runway at the *normal* exit 6000 feet from touchdown (after landing with a five-knot tailwind) when other exits were available 3000 and 6000 feet further down the runway. The A-4 aircraft, with its narrow wheelbase and high center of gravity, has always required caution while taxiing. Nosewheel steering has improved the ground handling capabilities of the TA-4F, but can cause severe swerving if utilized at excessive speeds. It is noted that the pilot involved in this incident primarily flies the A-7 (which has a lower center of gravity and increased turning capabilities during ground operations).

"The field support personnel displayed a basic unfamiliarity with the TA-4F by attempting to turn the aircraft with one brake locked. The pivot point of the main mount and the leverage available to swivel the nosewheel prohibits such a sharp turn without using excessive power. Trying to back the aircraft through a turn by pushing without benefit of a tractor is virtually impossible. *To deliberately taxi an aircraft off a paved taxiway as an alternative to waiting for a tow tractor is difficult to comprehend.*

"The aircraft was towed back onto the paved surface without benefit of a cockpit brake rider. The pin which safes the canopy jettison handle in the cockpit was not installed. Field support personnel did not wish to place an individual in the cockpit because they were unfamiliar with the escape system safety precautions required. The apprehension displayed toward the canopy

o Poor Headwork

and seat is commendable, but towing the aircraft at anytime without a brake rider is an unacceptable practice.

"Although there was no damage to the aircraft or injury to personnel in this incident, the unfamiliarity with the aircraft and its capabilities, as demonstrated, must be corrected to prevent future damage and/or injury. There can be no shortcuts if one is to operate in a professional manner."

The commanding officer, in conclusion, made the following recommendations:

"• Pilots review procedures and limitations for all aircraft in which they are current, ensuring that they do not confuse characteristics of one aircraft with another.

"• Commanding officers reemphasize to all pilots that the responsibilities inherent in accepting an aircraft for flight rests with the pilot until that flight has terminated.

"• Field support supervisors take advantage of the resources among tenant squadrons and activities for training support personnel in the knowledge of aircraft safety devices and escape systems." ◄

COORDINATION OF AIRFIELD GROUND TRAFFIC

"WITH tower clearance to take off on 36L, I commenced my takeoff. As I continued my roll, I noticed an A-4 (being towed) approaching the right side of the runway.

"Unbelievably, the tractor and A-4 proceeded onto the runway directly in front of me. Since I was already at 90 knots and had only an estimated 3000 feet of runway between my aircraft (an A-4C) and the towed A-4, I decided the only way to avoid a collision would be to take off over the towed plane. Fortunately, the day was cool and I lifted off about 1000 feet prior to reaching the towed A-4, passing over it at about 30-40 feet of altitude.

"I called the tower and asked them about the incident and received the reply that they would check into it.

"I don't know if anyone with the towed A-4 had radio contact with the tower but if they didn't they should have. There seemed to be a lack of supervision and control on the tower's part and on the part of whoever was in charge of the men towing an aircraft across an active runway."

Anymouse

THIS is typical of several Anymouse reports which have been received by the Safety Center during recent months reporting actual or potential conflicts between aircraft taking off or landing and vehicles or other traffic on the field. The extreme hazard of operating vehicles or towing aircraft on and around active runways without proper control and coordination by the tower was amply demonstrated by a night takeoff accident involving a TF-9J and an MB-5 crash truck.

In this case the TF-9J requested and received tower clearance for takeoff. After conducting a normal engine acceleration check, the pilot released the brakes and commenced his takeoff roll. Normal lineup was maintained throughout. About 3750 feet from the takeoff end of the runway the TF-9J struck an MB-5 crash truck which was crossing the duty runway enroute to the crash alert station.

The aircraft struck the truck broadside, slightly aft on the port side and at an estimated 125 knots. Impact point was about 15 feet to the right of centerline with the nose of the aircraft making initial contact. The forward fuselage area was crushed and torn back to the

intakes, the nose gear and port MLG sheared and the forward port wing panel ripped away.

One of the MB-5 crash crewmen who was standing on the rear of the truck was killed instantly in the collision. Another MB-5 crewman was seriously injured and two others suffered minor injuries. The crash truck itself was virtually destroyed.

The pilot ejected immediately after the collision. Following the ejection (which was later determined to be outside the safe operating envelope of the Martin Baker A-5A seat) the pilot contacted the runway still attached to the seat by the "sticker clips." His personnel parachute was not fully extracted from the parachute container and with the personnel parachute not inflated or blossomed, little pilot/seat deceleration took place prior to impacting the runway. The pilot was jarred loose from the seat following seat impact with the runway. The seat then tumbled, entangling the pilot with personnel and drogue parachute shroud lines. The pilot survived the ejection but suffered major injuries.

Following the collision the aircraft continued straight ahead, skidding in a counterclockwise rotation on the nose and port wingtip, burst into flames and came to rest about 5300 feet from the approach end of the runway, 10 feet from the runway edge.

During the investigation of this accident it was determined that for the 21 months prior to the accident, crash trucks had been using only one hardstand (position adjacent to the runway) when they were on crash alert. The position of this hardstand was such that crash trucks could move between the hardstand and the ramp area without the necessity of crossing the particular runway which was in use on the night of the accident. *However, two days* prior to the accident, the crash trucks had once again begun to use a hardstand located in a position which made it necessary for them to cross the duty runway when moving back and forth between the hardstand and the ramp. Unfortunately, the use of the new hardstand was a fact which was not fully comprehended by tower personnel. Therefore, on the night of the accident when one of the two crash trucks on the field called for clearance from the hardstand to the ramp area, clearance was readily granted because the tower operator failed to recognize that this request involved the movement of the crash truck across the duty runway.

At the same time the crash truck was cleared from the hardstand to the ramp area, a second crash truck was on the opposite side of the duty runway enroute to the hardstand which was being vacated by the first crash truck. Upon hearing the tower clear the first crash truck *from* the hardstand, the crew of the second crash truck *assumed* this also included clearance for them to cross the duty runway *to* the hardstand. The first crash truck successfully crossed the runway to the ramp but as the second crash truck was crossing the runway enroute to the hardstand, the collision occurred.

This accident illustrates the ease with which complacency can cause accidents. It also illustrates the necessity for tower operators to maintain strict control over the movement of all traffic on and about the field. Whether control and coordination is exercised by radiotelephone, light signals, follow-me trucks or whatever, all participants must have a clear understanding of the system in use – and abide by it without exception. ◄

Speechmakers and writers are cautioned never to start with an apology; so a term and style are being borrowed from a NATOPS Manual.

WARNING

Information and suggestions presented in this article are not intended to be in conflict with any NATOPS Manual. If any generalizations made do conflict with the NATOPS Manual for any model, the NATOPS Manual for that model shall be the authority and only source of information.

Caution Lights and

ALL AIRCRAFT in the Navy inventory are equipped with some type of warning or caution devices. They come in various sizes and shapes and alert pilots by tone, lights and limit gages. Some of the indicators are trouble free and only announce that something is wrong when it is wrong; some of the indicators are troublesome, i.e., the flightcrew is never quite sure whether there is a malfunction or not; some of the indicators lie like the dickens, are frequently disconnected or disregarded. However, since they are there in front of you and if they wake you up you might as well react.

While anyone can be a Monday morning quarterback after all the events are known, the concern is for those who do not accept a warning, in whatever form given, and seem to make express efforts to second guess the caution panel or warning light by a too-casual attitude. If one is allowed to make a premise without arousing the ire of all readers, it is this: **The caution panel was designed to alert pilots with visual indications (and aural) concerning the state-of-health of the bird.** This being the case, it is difficult to understand why anyone would ignore a voice that says, "I'm feeling poorly" or a light that calls attention to a deterioration of electrical power or a low level warning light that indicates some kind of fluid is low. Maybe, just maybe, some gents wait too long for coupled indications. You know what that is. It's the second indication that backs up the first; just like a light that comes on indicating a fuel tank is running dry and if you don't switch tanks the coupled indication is the sudden silence as the engine unwinds. Why wait for the big mallet that crashes on your helmet which also means *do something?* Now sometimes there's not much delay built in before the coupled indication, so that regardless of how fast you switch tanks after the light comes on there's no way to keep the proverbial mallet from whacking you atop the dome. Bad news! Dual symptoms are invaluable in attempting to analyze various system malfunctions and if you are blessed with enough altitude, airspeed, low weight, no external garbage and other good configurations you just might want to couple up. Generally, however, one harbinger of impending failure should be sufficient to "make plans." (Back to the premise.) If manufacturers provide system warnings, they must have been placed at that point in the system where the big bird watcher feels it is critical to the bird. For example, in the H-46 the caution panel has

gages for both transmissions. Additionally there are separate little jewels for chips, temperatures and pressures. Now, if the caution panel transmission light comes on there's no need for panic but *it is planning time!* More information may be needed on just what the problem is but if those other little jewels innocently withhold information from you it would seem prudent to land in the hockey field of the nearest female institution which happens to be only autorotation distance away. (Goodness only knows those girls might be the patriotic types who will lay to with mops and rags and wash down the aircraft for you while you're there. Besides, think of the stir you will create when you accept their invitation to dinner all dressed up in your nomex finest.)

NOTE

Hockey fields are not recommended as emergency landing sites for fixed-wing aircraft.

Now, the sage suggestion offered here is not to split the needles, enter an autorotation and prang the bird on landing, much to your chagrin. That would be unnecessarily compounding a single or coupled indication and never will convince the Skipper or the AAB that you "done good." No one will believe your excuse for landing in Miss Glass' hockey field to begin with; let alone if you shoot a PEL (precautionary emergency landing) and bust the bird. Set it down nice and easy and when you make that long distance collect call to the squadron you can always say, with a free conscience, "Hello, Skipper, you'll never believe this but . . . "

From the tons of paper which arrive at NAVSAFECEN concerning incident and accident reports there are far too many instances of pilots reacting too quickly to single and coupled indications with the result that an approach or landing is hurried and the bird ends up damaged. Sob! Absolutely nothing will stand you in better stead than thorough knowledge of those NATOPS procedures and completing the checklists appropriate to the occasion. We're not talking about those indications such as a quiet motor when you have to execute an emergency landing or bail out right now. We're talking about situations such as rising temperatures and pressures, generator and CSD warnings, sump and chip lights, etc. where you have some time and within reason can go about handling the malfunction in a workmanlike manner and execute a normal approach and routine, uneventful PEL. Just like:

- F-4 After about one-half hour of flight the pilot noticed a check hydraulic light and utility hydraulic pressure dropping to zero. He aborted the mission and lowered gear and flaps by emergency procedures and made an uneventful landing.
- A-4 At 10 miles on final on a night CCA the gear was lowered. A loud bang was heard and the pilot noted the utility hydraulic system failure light on. Landing was uneventful but during taxi the hook would not fully retract.
- A-6 One mile prior to touchdown both flight hydraulic system gages started fluctuating between zero and normal pressure. The master caution light and the backup hydraulic light on the annunciator panel illuminated. Landing and rollout were normal.

d Coupled Indications

By LCDR Donald A. Mohr
Navy PRO
The Boeing Co.

- A-7 After takeoff pilot noted RPM, TIT and fuel control fluctuations. Flight aborted and an uneventful landing followed.
- S-2 Following the fourth FCLP the starboard fire warning light illuminated. Pilot reduced power on that engine and made an uneventful landing. No visible fire but the engine was secured on the runway.
- P-2 After a normal feather and unfeather prop check on an out-of-check test flight the starboard recip sump light illuminated with the analyzer indicating ignition breakdown on all cylinders. The engine was feathered and an uneventful landing made.
- P-3 While indexing the props on initial climbout the No. 1 prop pump light on the No. 1 engine flickered and then came on steady. The engine was secured and an uneventful landing made.
- C-47 (Still have a few.) After 35 minutes of flight the right engine began to run rough, the oil pressure began fluctuating and the oil temperature rose slightly. The engine was secured and an uneventful landing was made.
- C-54 After approximately one hour of flight the

No. 1 engine CHT began to drop and the engine began running rough. The engine was secured and an uneventful landing made.

• C-118 During bounce drill a loss of BMEP and power on the No. 2 engine was noted. The pilot's attention was directed to a large oil leak. The engine was secured and an uneventful landing followed.

• C-121 While in a left orbit on an operational mission a fluctuation of 20 BMEP occurred on the No. 4 engine. A visual check revealed torching from the No. 3 PRT. The engine was secured, an emergency declared and the pilot headed for the nearest field. An uneventful landing resulted a couple of hours later.

• C-130 While climbing through 15,500 feet the utility hydraulic system pressure rose to 3600 psi. An NTS check was conducted on the No. 1 and No. 2 engines to determine which pump had malfunctioned. The faulty engine (No. 1) was secured and a return to base was made followed by an uneventful landing.

• H-53 After descending to 8500 MSL the main transmission master caution/chip lights illuminated. The pilot made an immediate PEL. (Twenty seconds after touchdown transmission oil pressure dropped to zero and the aircraft was shut down.)

In the examples used there were no false alarms – there were actually one or more malfunctions in each case. However, one never knows when a caution light illuminates whether it's for real or not; so believe it and make plans – regardless of whether you're in the bounce pattern or hundreds of miles at sea. You fixed wing types head for the nearest field and friends in the rotary world make use of Miss Glass' facilities, drop in – carefully – for tea or dinner whenever the lights turn bright over an improved site.

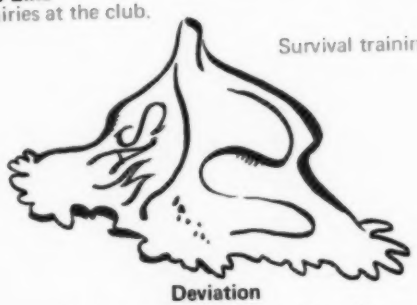
This article was adapted from the original submitted by LCDR Mohr who restricted his article to a discussion of the subject relative to helicopters only.

More Terms To

Checkpoint
Disbursing on payday.

Rhumb Line
Waiting for daiquiries at the club.

True North
Survival training at Brunswick, Maine



Deviation
Subject matter for X rated movies.

Dead Reckoning
When you pass a car on a curve assuming no one is coming, but there is.

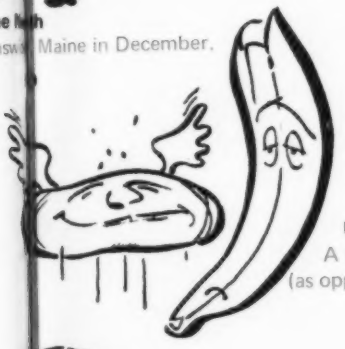
NFO
National Farm Organization
(What Else?)

To Navigate By

True Nath
unswi Maine in December.

Antenna
Your mother's sister.

OMNI
What Yankees call grits.

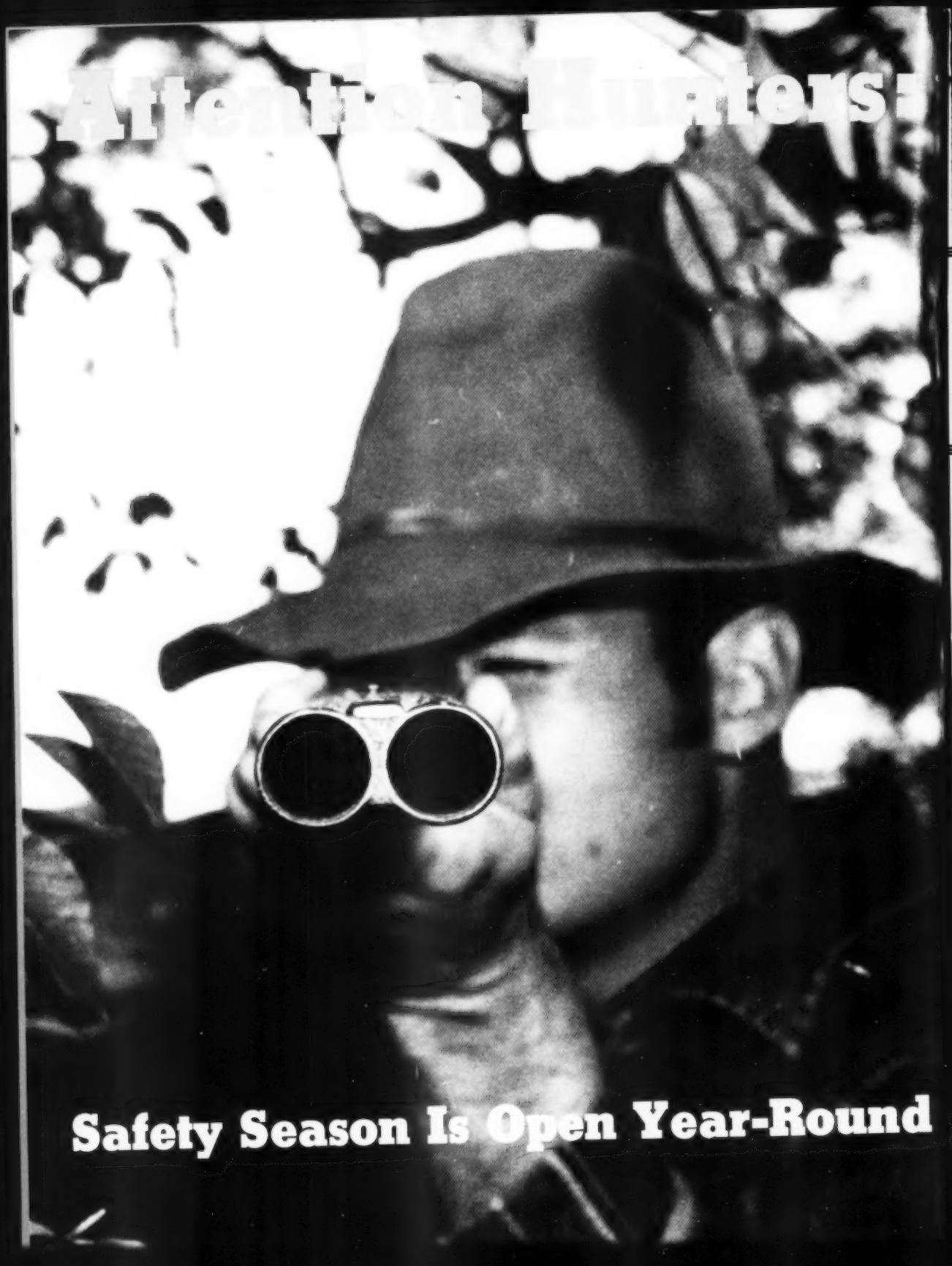


Update
A ready to fly fruit
(as opposed to a down banana).

Sins
Subject for M rated movies.

zation

Range Cursor
Navigator trying to fix the family stove.


Attention Hunters!
Safety Season Is Open Year-Round

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HUNTING safety is always in season, no matter whether you are after bear, deer, waterfowl or small game. Every fall there are numerous injuries and deaths on hunting expeditions – accidents which could be prevented.

The greatest cause of hunting mishaps is careless gun handling. One state's recent statistics, for example, read something like this: [1]

75 percent of all hunting accidents involve shotguns.
72 percent of all hunting accidents happen at ranges under 50 yards.
66 percent of all hunting accidents occur while hunting small game.
53 percent of all hunting accidents occur with clear visibility and open cover.
38 percent of all hunting accidents involve one or more persons under age 19.

[1] Fiscal Year 1969 State of Virginia figures courtesy Va. Commission of Game and Inland Fisheries, Education Division.

The Navy has its share of hunting accidents – not a large number perhaps, but if it's your fingers or toes which get shot off or your friend who gets mistaken for a deer, it will matter a great deal. And the best way to keep hunting accidents down is a continuing safety education program on the subject. Unfortunately, until the Naval Safety Center accumulates data from Accidental Injury/Death Reports (OPNAV 5100/1) over a period of several years, we can't effectively discuss Navy/Marine Corps hunting accident trends. In addition, unlike aviation accident statistics for instance, there will never be any exposure data so that we can look at the safe hours as opposed to the accidents and determine the accident rate. But statistics aside, there's much to be learned from specific hunting accidents. Here's one which will do for a starter.

On a November morning last fall near Whidbey Island, Wash., a petty officer and a companion were hunting ducks from a 15-foot rowboat. The PO moved from the stern of the boat to the bow, past his companion who was rowing. After he sat down, a flock of ducks went by and he fired, then reloaded his gun. Events are not too clear from here on and unfortunately, the accident report does not include a statement from the PO's friend. The PO found himself in the water. He has no recollection of the boat tipping over but he does remember throwing his gun clear as he hit the water. He sustained a shotgun wound in the back of his left shoulder. There was no evidence of powder burns. He and his companion were rescued after spending an hour in the water on and around the capsized boat.

Here's another. An airman violated common sense when he carried a loaded shotgun in his car. After

Always carry the gun so that you can control the direction of the muzzle.

Be sure of your target before you pull the trigger.

See And Be Seen!

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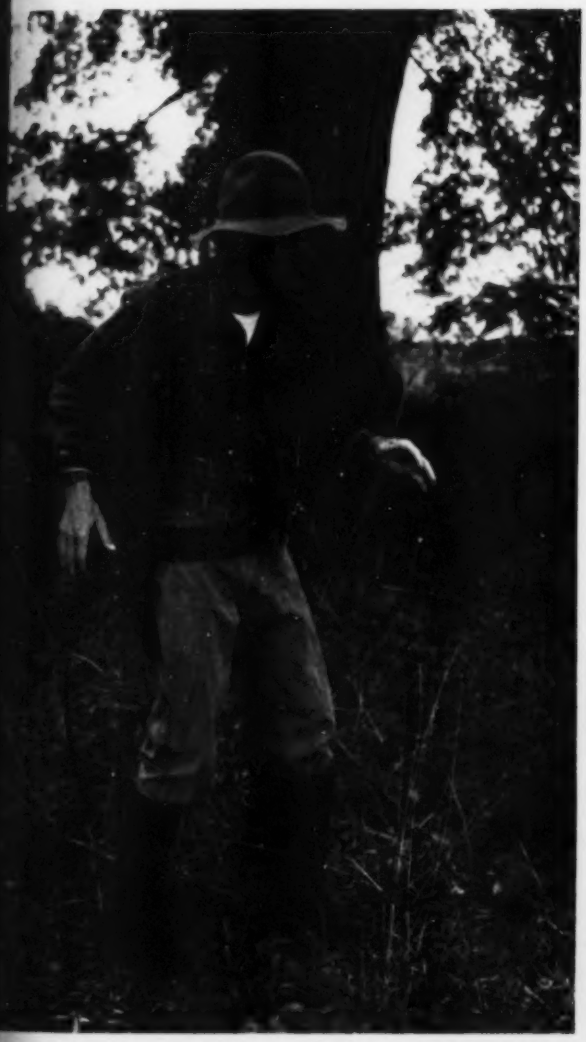
arriving at his destination, he was sitting in his car with his feet propped up on the seat and the gun lying on his lap with the barrel pointed towards his feet. As he straightened up to get out of the car, the gun went off, amputating the second and third toes of his right foot. A similar injury occurred earlier this year when a petty officer was hunting with a .22 caliber pistol. He was



Three Navy men were the victims of "Quick-Draws" during FY 70.

holding the weapon at his side with the safety disengaged when it accidentally discharged and wounded him in the right foot.

An enlisted man on authorized leave was actually involved in two hunting accidents on the same day last fall while hunting wild boar in a Florida preserve. At 0700 in his red hat and rain gear he entered a densely wooded area on a long narrow road or "tram." His uncle and a friend entered the same woods two miles farther up the tram with dogs. The plan was to drive the wild boars ahead and across the road. The woods were thick and gunshots could be heard since it was a popular hunting area. At 0730 as the enlisted man was walking along he heard the brush rattle, felt a bump on his left leg like being hit with a stick and then heard the brush rattle on the other side of the tram. At the time he heard no gunshots. He realized he was in a dangerous area and laid flat and shouted for his brother and father. He waited but apparently no one was in the immediate area. About 10 minutes later his brother shot a boar and came back to get him to help track the animal. At this time they examined the man's leg and discovered an abrasion with only two or three drops of blood on it. They put medication on the wound, sure that no serious injury had occurred, and continued hunting until midafternoon when the enlisted man returned to the truck because his leg bothered him. A half-hour or so later he removed the clip from his .32 caliber pistol. After removing the clip and moving the slide open, he turned to draw his knife to pry out a shell remaining in the chamber when the slide went home and the weapon fired, wounding him in the left calf. He applied a temporary tourniquet to retard the bleeding and sounded the truck horn for help.

His companions returned shortly thereafter and took him to a hospital. X-ray showed a fractured fibula and *two slugs* in his left leg.

Continued

Never point a gun at anything you do not want to shoot.

Always be sure barrel and action are clear of obstructions.

Treat every gun with the respect due a loaded gun.

Never climb or jump with a loaded gun.

The Ten Commandments

The men involved in the accidents we have just described violated the "Ten Commandments of Gun Safety." This particular version of the "commandments" comes from the Ithaca Gun Co., Inc.:

1. Treat every gun with the respect due a loaded gun. This is the cardinal rule of gun safety.
2. Carry only empty guns – taken down or with the action open – into automobile, camp or home.
3. Always be sure barrel and action are clear of obstructions and that you have only ammunition of the proper size for the gun you are carrying.
4. Always carry your gun so that you can control the direction of the muzzle, even if you stumble. Keep safety on until you are ready to shoot.
5. Be sure of your target before you pull the trigger.
6. Never point a gun at anything you do not want to shoot – whether loaded or empty.
7. Never leave your gun unattended *(i.e., leaning against a tree or fence where it can be knocked over and discharged or lying in a boat, etc. – Ed.)* unless you unload it first. Store guns and ammunition separately beyond reach of children or careless adults.
8. Never climb a tree or fence or jump a ditch with a loaded gun. Never pull a gun to you by the muzzle.
9. Never shoot at a flat, hard surface or the surface of water.
10. Avoid alcoholic drinks before or during shooting.

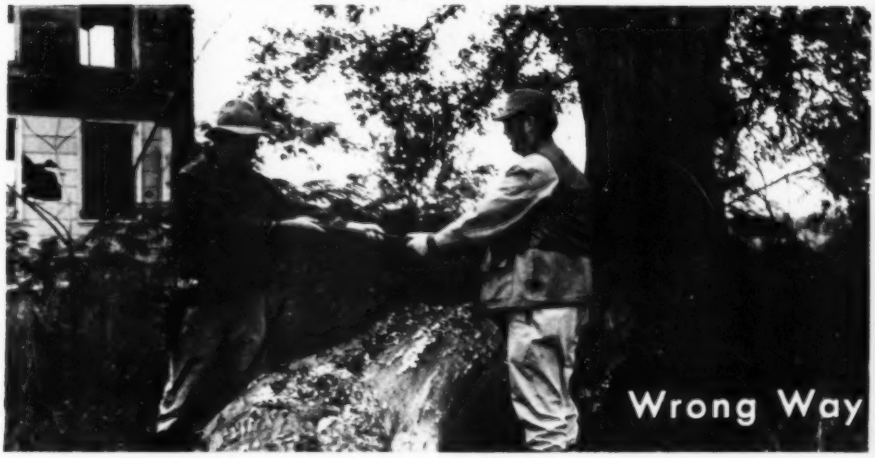
We might add a few miscellaneous rules: Don't hunt if you're tired or physically run down – a tired or sick hunter is not a safe hunter. And then there's the most important rule of hunting safety – see and be seen. Before you fire make sure it's game you're firing at and make sure that other hunters in the area can see you. Some states are now requiring hunters to wear "high-visibility orange." This brilliant color doesn't resemble any other color found in nature and it stays vivid as long as there is daylight, in contrast to red, for example, which can appear black at low levels of light.

And finally, before you leave on a hunting trip, make sure that somebody knows in detail where you are going and what time you expect to return. (If you don't check in they can alert search forces.) Report back upon return and, whenever possible, don't hunt alone. ◄

Never leave your gun unattended.

Avoid alcoholic drinks before or during shooting.

Never pull a gun to you by the muzzle.



CNO Passes The Word
on Small Arms Safety

FROM: CNO
TO: NAVACT
UNCLAS
SMALL ARMS SAFETY
1. INFORMATION REPORTED TO NAVSAFECEN INDICATES FORTY-EIGHT OFF-DUTY INJURIES AND TWO FATALITIES OCCURRED DURING FY 70 AS A RESULT OF MISHANDLING OF PERSONAL SMALL ARMS DURING RECREATIONAL ACTIVITIES.* THESE MISHAPS DO NOT INCLUDE INTENTIONAL WOUNDINGS OR SUICIDES. FOURTEEN OF THE INJURIES WERE THE RESULT OF PRIVATE HUNTING ACCIDENTS.
2. DURING THE SAME PERIOD TWENTY-SIX INJURIES AND TWO FATALITIES WERE REPORTED AS A RESULT OF MISHANDLING SMALL ARMS WHILE ON DUTY. AN ADDITIONAL SIX INJURIES, ALL MINOR, WERE REPORTED AS A RESULT OF MALFUNCTIONS OF WEAPONS OR AMMUNITION. NONE OF THE ON-DUTY MISHAPS WERE IN A COMBAT SITUATION.
3. THE NUMBER OF OFF-DUTY INJURIES FROM SMALL ARMS IS CONSIDERED TO BE CONSERVATIVE SINCE ONLY THOSE REQUIRING MEDICAL ATTENTION FROM A MILITARY FACILITY OR RESULTING IN A FATALITY WERE REPORTED.
4. THE HUNTING SEASON IS APPROACHING AND CAN SERVE AS THE BASIS FOR RE-EMPHASIZING THE FUNDAMENTALS OF SMALL ARMS SAFETY. THE NUMBER OF ON-DUTY MISHAPS IS SUFFICIENT BASIS FOR A HARD LOOK AT THE QUALIFICATIONS OF PERSONNEL WHO ARE REQUIRED TO HANDLE OR HAVE ACCESS TO SMALL ARMS.
5. IT IS RECOMMENDED THAT ALL ACTIVITIES:
A. CONDUCT A REVIEW OF SMALL ARMS HANDLING SAFETY AND REQUALIFY, WHERE WARRANTED, THOSE PERSONNEL REQUIRED TO HANDLE SUCH WEAPONS.
B. WHERE ON-BASE HUNTING IS PERMITTED REVIEW THE ADEQUACY OF EXISTING CONTROL PROCEDURES. IT IS FURTHER RECOMMENDED THAT PERSONNEL BE REQUIRED TO CERTIFY IN WRITING KNOWLEDGE OF LOCAL HUNTING REGULATIONS.
C. ENSURE THAT PERSONNEL WHO ARE ISSUED RECREATIONAL SMALL ARMS FOR OFF-BASE HUNTING ARE FULLY QUALIFIED IN THEIR USE.
6. THIS NAVACT CANCELED 31 DEC 1970.
BT

* Of these, the two fatalities and 10 of the injuries occurred while loading or unloading firearms. Of the 14 injuries resulting from private hunting accidents, four were from the loading or unloading group. Three injuries resulted from attempted "quick-draws" and the remaining 25 injuries were results of various other improper handling accidents.

Old Pro

LT Jerry T. Hickman, USN
HC-1 DET 4

AFTER making a normal passenger pickup from an ammunition stores ship the SH-3A piloted by LT Hickman headed back for USS HANCOCK. Clearance for landing was given while the H-3 was stationed on the port beam at 100 feet of altitude. Hickman maneuvered the aircraft into a 360-degree turn and had completed 70 degrees when a loud clattering sound was heard accompanied by a strong vibration and then followed by a loud bang. The aircraft started a violent rotation to starboard accompanied by roll oscillation and the tail rotor assembly came to a complete halt. At about 80 feet AGL and 25 kias, autorotation was initiated by the pilot and the engines were retarded to ground idle. The aircraft impacted the water in an upright position and remained upright for two or three minutes, during which time the pilot actuated the flotation gear and secured the engines. Shortly thereafter the after section of the H-3 broke free while the main forward section of the helo rolled over and floated in an inverted position. All members of the crew egressed the aircraft safely and were soon rescued by a destroyer whaleboat. The AAB could make no positive determination as to the cause of the accident because the tail section of the aircraft was not recovered. However, material failure/malfunction from aft of the number two bearing was strongly suspected. The Commanding Officer, USS HANCOCK in his endorsement to this AAR stated: "The skill LT Hickman demonstrated by landing his aircraft from the altitude that the tail rotor failed certainly attests to his expert ability and calmness in an emergency. A disaster was avoided by this young officer's most capable transition to autorotation flight."

WELL DONE LT Hickman!

notes from your flight surgeon

Pilot Fixation

DISORIENTATION and fatigue contributed to a fatal accident in which a student pilot in a T-28C crashed during a night navigation solo hop, his second flight of the night. He had not checked the flight schedule and, unaware that he was to fly two launches that night, he had spent the day water skiing.

Investigators concluded that the most probable cause of the accident was pilot fixation on a flashing red light on top of a TV relay tower. The light was on the flight path of aircraft flying along this navigation route. (During the investigation another student reported he had tried to "follow" a light on top of one of the TV relay towers on a previous night flight. He had developed vertigo but it disappeared after he checked his instruments.)

"It must be assumed that in spite of his excellent physical condition," investigators stated, "the student was somewhat fatigued by his earlier exercise and his first night navigation flight which had lasted 2.7 hours." The student had plenty of time to rest. He was through the basic training syllabus except for night navigation flights one and two. He had finished his last day navigation flight at 1530 the day before the accident. The next demand on his time was to be present at the night flying brief the following evening at 1830.

After the accident the board reconstructed and flew the estimated flight path a number of times as briefed. They concluded that while making a course change and going from an area of light to one of comparative darkness, the student became disoriented. At somewhat less than peak efficiency as a result of fatigue, he mistook the obstruction light on the top of the TV tower 250 feet above the ground for the aircraft ahead and probably attempted to maintain a relative position on it until he struck the ground.

The investigators recommended:

- That night navigation flights one and two be flown on separate nights. (CNABATRA's endorsement to the accident report stated that the applicable instruction would be changed to limit student night navigation flights to one flight per night.)
- That the importance of adequate rest before all flights be reemphasized to all student pilots with particular emphasis on obtaining adequate rest before night flights.

All pilots should be aware of the danger of fixating on a single light in the absence of other visual cues, because night spatial disorientation due to isolated ground lights can even occur to rested, experienced pilots.

Helicopter Rescue Sling

THE helicopter rescue sling is going to stay with us. The Naval Air Systems Command has amended its previous decision to no longer procure rescue slings and has requested the Aviation Supply Office to continue to support the procurement of the sling assembly and its components.

Crash Diet

INVESTIGATION of a fatal pilot factor accident turned up the fact that the pilot was in the habit of putting himself, from time to time, on a severe, non-medically-supervised diet to meet weight requirements for the command's wrestling team. This was learned after the accident from friends and fellow wrestlers, none of whom were connected with the squadron.

On his return from Vietnam the preceding year, the pilot had weighed 220 pounds. That fall he embarked on a routine of stringent physical exercise and strict dietary limitation. In the three months prior to the accident he had decreased his weight by 53 pounds. His wrestling companions stated he did this by eating one or, at the most, two light meals a day with a daily workout of at least three hours. He was accustomed to reducing his weight in this way by 10 to 12 pounds in three or four days.

The pilot had told his wrestling mates that he did not intend to eat or drink *anything at all* for a specific five-day period in order to make the weight limit for a match on the sixth day. Friends state that they did not see him eat during this time. *The fatal accident took place on the fourth day of this time period.*

The investigating board concluded that the pilot's unsupervised diet was a contributing factor to the accident. There was a "distinct probability,"

the board said, "that his reaction time and attentiveness were impaired by his weight reduction method." "The pilot's unsupervised diet critically impaired his judgment, affecting his ability to control the aircraft," the first endorser wrote.

This is one of the most extreme cases of self-imposed dieting reported to the Safety Center in recent years. Fortunately, such cases are rare.

Make sure that in your efforts to become physically fit you do not, in the words of the investigating flight surgeon, "become aeronautically unfit."

Prevents Burns

DURING a low pass an OV-10A stalled. The pilot was unable to regain flying speed because of mountainous terrain and the low altitude of the aircraft. About 10 seconds after entering the stall he elected to eject, warned the aerial observer, positioned himself and pulled the seat pan firing handle. The aerial observer's seat ejected, followed by the pilot's seat.

The pilot remembers cartwheeling through the air, then suddenly finding himself suspended above the burning aircraft wreckage. Protecting his face with his arms, he landed about 10 meters from the fire. He sustained a second degree burn of the left lower leg, a first degree burn on his right cheek and a small second degree burn on the tip of his nose. He was successfully rescued.

The pilot's proper use of flight safety equipment saved him from serious injury. His nomex flight gloves and flight suit as well as having his helmet visor down prevented more serious burns, investigators reported.

Mid-Air

A COMBINATION of fatigue and the residual effects of alcohol figured in a mid-air collision of two A-4s in a four-plane formation on an ordnance training hop. Both pilots ejected successfully.

The fleet replacement pilot who caused the mid-air by failing to maintain visual sight of, and safe separation from, the aircraft ahead in the formation had obtained minimal sleep for three nights preceding the accident.

"There is little doubt in this reviewer's mind," an endorser to the accident report wrote, "that the pilot was in a less-than-optimum state of physical and mental alertness, particularly in view of the fact that this was to be his initial flight under heavy weight, high drag, live ordnance conditions."

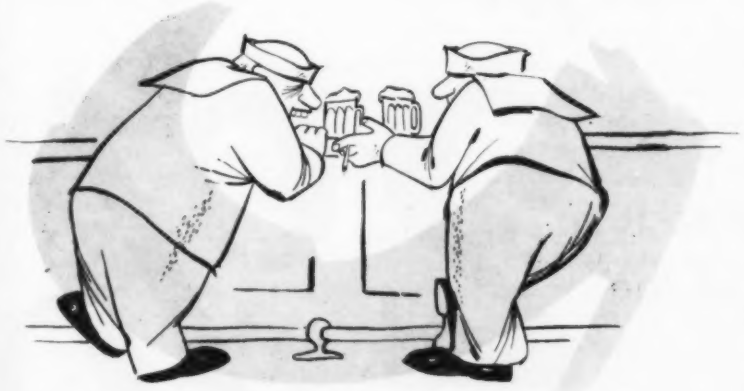
On Sunday night the pilot had been out on the town until 0100. Monday night he visited a resort from 2100 to 0500. Tuesday night was the "last night of deployment party" and he stayed out until around 0430. Wednesday morning he got up at 0930, took part in group picture-taking, ate lunch at the club from 1100 to 1300 and at 1300 briefed for the flight. The accident occurred at about 1400.

The pilot had been consuming a "light to moderate" amount of alcohol during his evenings in town, the investigating flight surgeon reported. There was no question in the flight surgeon's mind that fatigue plus the residual effects of alcohol were crucial factors in the accident.

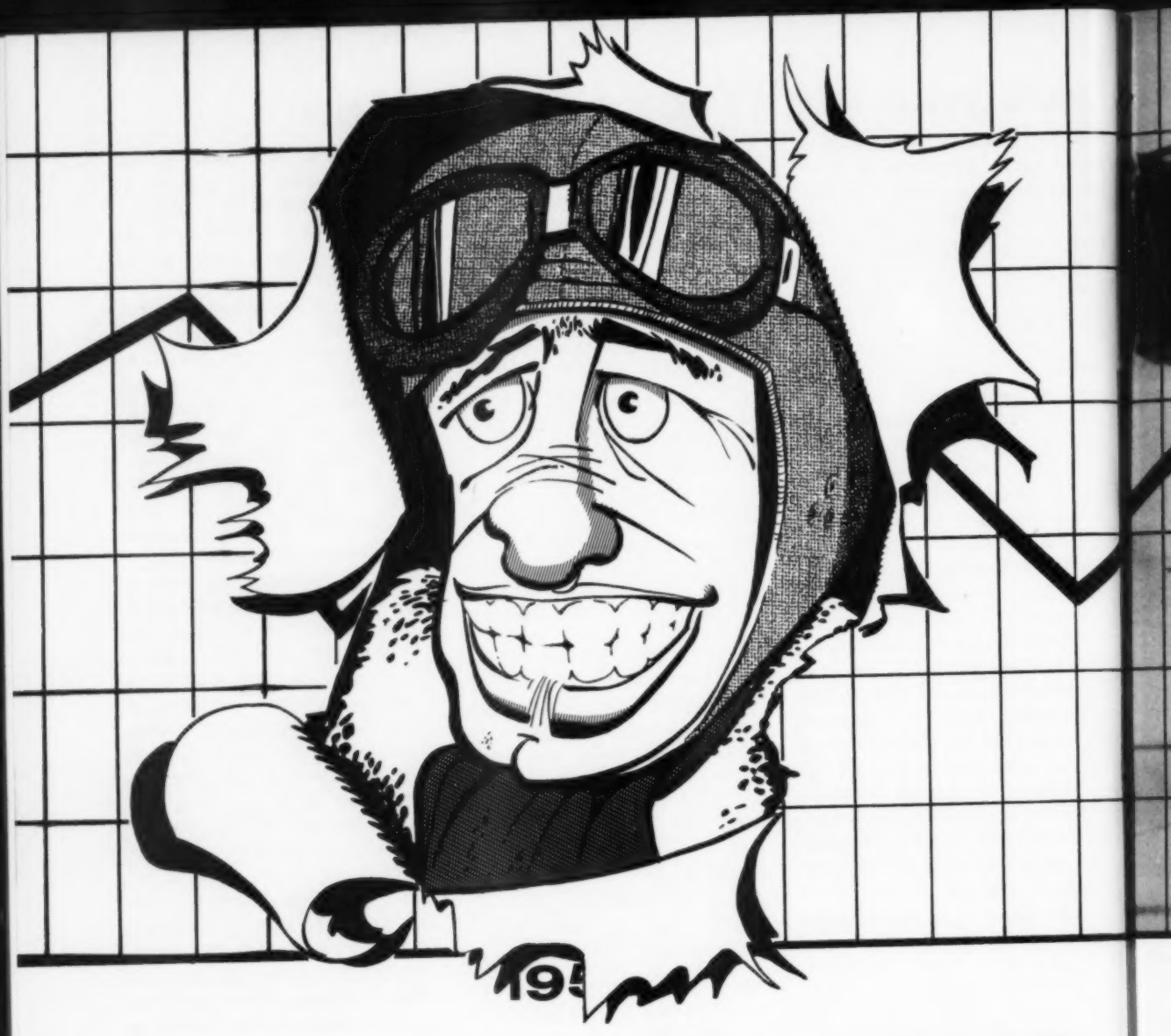
"These residual effects," the flight surgeon stated, "undoubtedly caused a slowing of the pilot's reaction time and a decrease in his ability to make effective decisions rapidly and thereby contributed to his collision with another aircraft."

The flight surgeon's recommendations include:

- That *all* pilots, especially fleet replacement pilots, be reminded of the subtle and thereby doubly dangerous effects of fatigue and that a combination of fatigue and alcohol – even more than 12 hours after ingestion of the alcohol – is a dangerous and often deadly one.
- That "last night of deployment" parties be confined to the night *after* all deployment flying has been completed.



"Look at it this way, dieting is merely going to great lengths to get rid of great widths!"



There's no percentage
in being one of the

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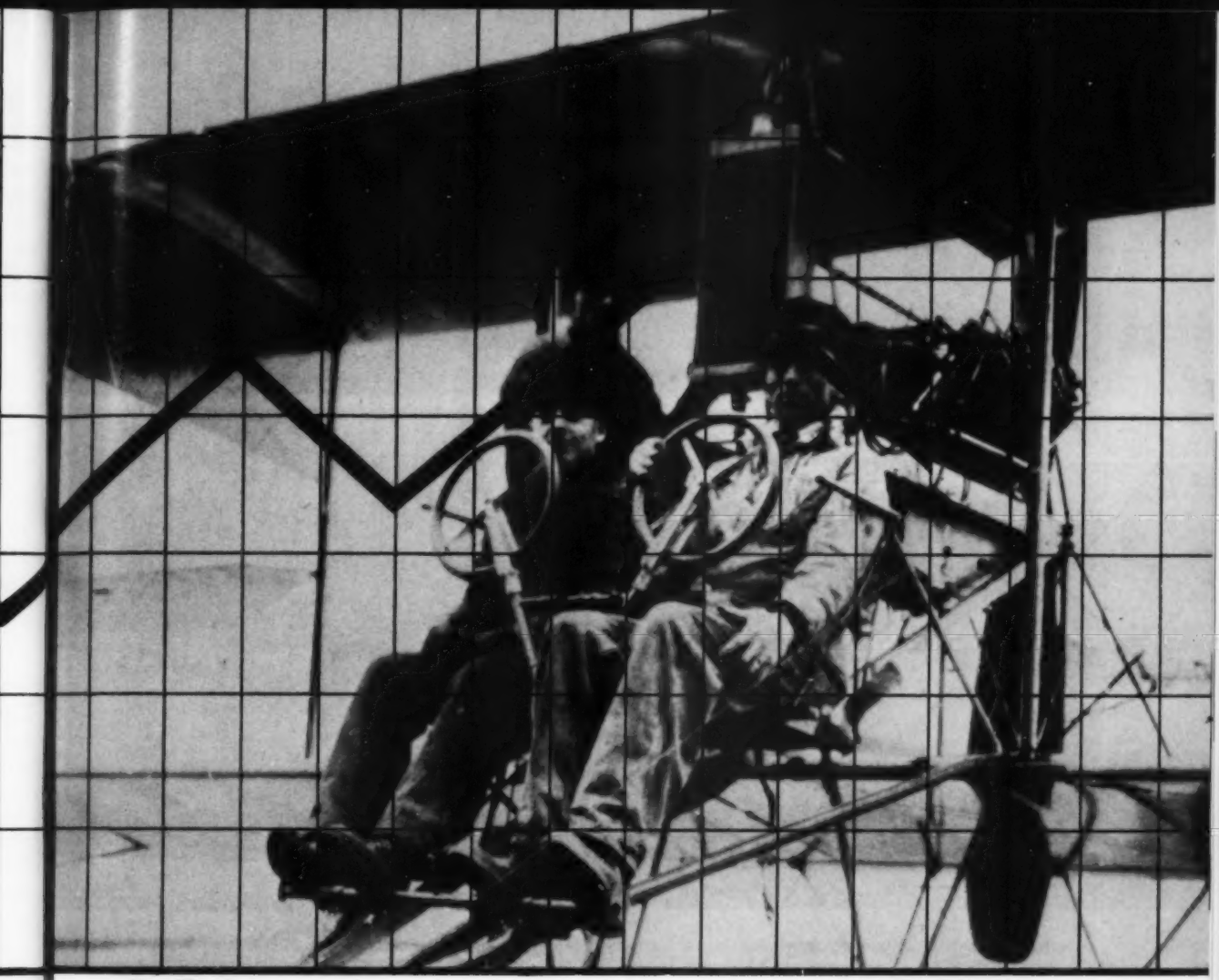
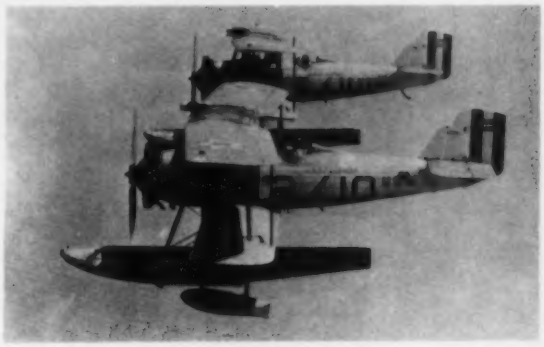
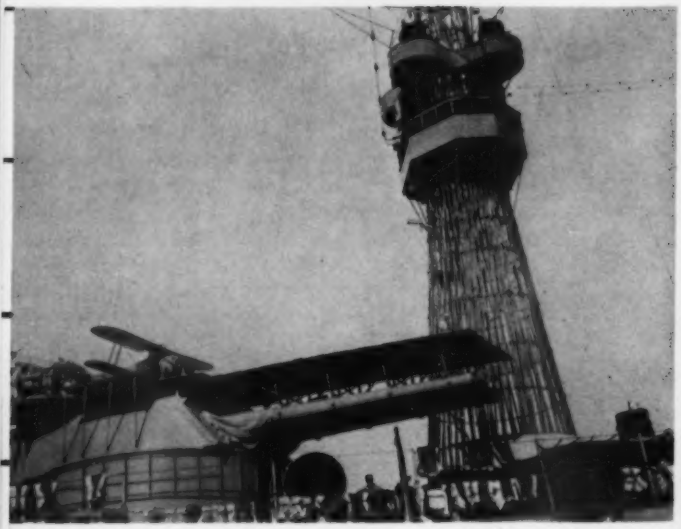


1960 1970

AVIATION SAFETY has been in existence since the beginning of aviation. (Ain't that jest gran'!) Probably because the refugees from bicycle repair shops who were the early aviation honchos were very versatile – they could read and write. Since these nimble-fingered rascals were also quick to take pen in hand, it was easy for them to lay down rules and regulations concerning operation of the airplanes they constructed. So if anyone ever tells you NATOPS is new, don't believe a word. Why even those goliaths of the air, affectionately called "poopybags" (one word), had safety regs and what was good enough for lighter-than-air was good enough for all of aviation. However, even in the r-e-a-l early days there were the two-percenters ("disbereavers") who had their own way of doing things.

Aviators of WW I days were the glamour boys of the times and reigned supreme during all of the twenties and thirties until second-seated by tank commanders in the forties, rangers in the fifties and green berets in the sixties. Anyway, back to the open cockpits, white scarves and puttees. The daredevil (movie version) who spun his own prop, jumped into the cockpit and roared off across the grass with the rudder switching full throw in both directions was an individualist. He was bound by very few rules, flew rather slow, simple machines and in most cases was a single, uncomplicated, simple person. (Not simpleton! Plain.) But times change – progress progresses and both men and machines have become complicated. Instead of roaring up to the flight line in a twin-six Packard phaeton five minutes before departure





and still getting airborne early, nowadays a pilot arrives in his Rover or Mercedes sedan two and a half hours before takeoff time and still has to hustle to get everything done before scheduled departure. Gimme the good old days! You dig? Getting back to the subject – the early birds – pilots, in aviation (Hollywood notwithstanding) were a hard working, disciplined, highly competitive, dedicated small group of officers and enlisted men. They were fighters. They fought for better aircraft and engines. They fought drastic cutbacks in the thirties during the big depression. They accepted any challenge thrown their way. They developed tactics where none had existed. They developed plans and procedures and proved them in battle problems. They worked, fought and many died moving naval aviation forward. Pearl Harbor and the beginning of WW II was the coming of age of naval aviation – the debut, if you please, of a real fighting branch of the Armed Forces. A wedding ensued between the Navy and the aircraft industry – Grumman and Vought for fighters; Douglas and Curtiss Wright for dive bombers; Grumman and Douglas again and General Motors for torpedo bombers; Lockheed, Consolidated and Martin for seaplanes and bombers; Goodyear for blimps. What an array! And all of this time where were the two-percenters? Right there man, right there. They were the wingmen who left their section leaders and took off on their own. They were the dive bomber pilots who went back for a second and third pass against orders. They were the patrol types who launched an attack when their orders were to shadow. We had 'em then; we still have them now.

Looking back over the past three decades, the size of the Navy, number of aircraft and number of active duty pilots looks similar to a sine curve. There was the WW II peak in '45, a valley in '47, another peak (Korea) in '51, another valley in '57, a third peak (Berlin) in '61, a dip in '63, a rise again (Vietnam) in '67 and now a downward slide. A school kid strolling down the street, popping bubble gum like mad, while performing tricks

with a yo-yo doesn't realize that his toy with its climbs and dives and 'round-the-worlds is tracing a pattern similar to that of the history of naval aviation.

Peaks, valleys, rises, declines, yo-yos, old fudds; what have they got to do with two percenters? Hold your horses, we'll get to that. Before you bolt just remember: What is, has been. Simple men and machines are now sophisticated. Technocracy is now technology. Pilot Handbooks are now NATOPS manuals. Fixed guns have yielded to missiles. All of the coming and going, training programs, tactics, hardware, software – *the whole mish mash* – exists today as improvements, evolutions and changes from earlier versions. Everything has become more complex except the operators.

It's hard to distinguish between sins of omission and commission but neither is excusable. In dollars and cents, to use a cute illustration, it makes no difference whether a strike/fatality occurred because the clown didn't know better or knew better and attempted it anyway. In this instance a two-percenter becomes a zero.

However, the two-percenter we're interested in is the pilot who isn't convinced that his model NATOPS, for example, is the best available source of information on his bird or, if he is convinced, then why he isn't familiar with it from cover to cover. We're also interested in the two-percenter who flouts or ignores squadron SOP. *Ad infinitum.* Another example of the one we want to reach is the two-percenter who doesn't check his enroute/destination weather while on a cross-country or the one who taxies in congested areas without a taxi director/wingwalkers. *Ad nauseam.* Finally, the two-percenter who goes it alone or, through ignorance, attempts something outside of the flight envelope of his bird. *Ad absurdum.*

This wasn't written for YOU; it's for the other guy – the flathatter, the hot rock who makes up his own Sandblower route, the guy who goes supersonic over the city at night, the clown who does dirty rolls in the traffic pattern. If we can get him to join the club, we've got it made! Don't be a two-percenter! ◄

Contamination of aircraft hydraulic systems has been recognized as a hazard to safe flight. Because of this, a comprehensive Navy-wide program of preventive maintenance has been developed by NAVAIRSYSCOM and senior aviation commanders.

On 20 August 1970, Rear Admiral N. O. Whitman, USN, COMNAVAIRPAC Force Material Officer, presented an address on this subject to a COMNAVAIRPAC Flag Officers' Conference at NAS Whidbey Island. The substance of this address, reprinted below, gives an overview of the problem and the corrective action being undertaken. Readers desiring further information on the subject may refer to the article, "Hydraulic Contamination," on page 4 of the Fall 1970 MECH.

HYDRAULIC SYSTEMS CONTAMINATION

"MIKE" FOD (microscopic foreign object damage) is the term used by the USAF to describe the effects of hydraulic fluid contamination. The results of aircraft accident investigations and DIRs (Disassembly Inspection Reports) have shown with increasing frequency that we have a major problem on our hands. Our missile people and private industry, including airlines, have recognized the problem much sooner than we have in our military aircraft and they have instituted stringent control procedures.

What is hydraulic contamination? It consists of particles of foreign material which may or may not be visible to the unaided eye. Contaminants such as water, flecks of metal, rubber, sand, paint, etc., can sometimes be seen by the unaided eye, causing some people to think they can prevent contamination by making the fluid *look* clean and red. This is not so. Hydraulic fluid can appear clean and red and still be unacceptably contaminated by the presence of microscopic siliceous, metal or organic particles. Because this contamination cannot be seen by the unaided eye, it poses an insidious threat to safety. Just as visible contamination can cause catastrophic failure in an aircraft system, invisible contaminants can cause flight control failures, premature component wearout and high unscheduled maintenance man-hour consumption with associated NOR (not operationally ready) conditions. As an example, the near zero tolerances of the F-4 flight control servo valves causes them to be particularly susceptible to contamination which can erode metering edges and cause degradation of system response. A build-up of contaminants can cause high threshold forces that may produce binding, instability or erratic system operation.

In addition, the finish on hydraulic components is exceedingly smooth and clearance between two running surfaces (as previously stated for the F-4 servo) is often so small that bacteria would have to flatten out to get by! In this subminiature world, a particle looks like a jagged boulder. Once these fine surfaces are broken, the metallic byproducts from continuing gouging join in to further erode the surfaces. These internal components

are machined to close tolerances for good reason; the demands for miniaturization with extreme strength and sensitivity make high hydraulic pressures – and with it, close tolerances – mandatory. These are facts of life nowadays and our maintenance organizations will have to live with them and understand them.

What are we doing about the problem now that it has been recognized and identified? NAVAIRSYSCOM, due to increasing evidence of contamination as reported by the Naval Safety Center findings and fleet inputs, convened a conference in March of this year to attack the problem. The conference recognized deficiencies in supervision, maintenance practices, system/equipment design, GSE (ground support equipment), technical data, training, cleanliness, housekeeping and contamination definition/measurement. An extremely active program is being pursued by NAVAIRSYSCOM, its field activities and ourselves to overcome the problem. The following primary actions have been or are being taken:

- Directives have been released calling for improved maintenance practices, i.e. immediate things to do and not to do to prevent contamination.
- The Navy has established the standard for maximum hydraulic systems contamination, in both aircraft and GSE, at SAE Class 5. (This establishes particle count limits in various micron ranges.) This standard must be met by all levels of maintenance.
- Contamination analysis kits have been provided to detect this level of contamination by organizational and intermediate maintenance activities. The depots have this capability in their labs.
- NAVAIRSYSCOM is issuing IAFBs (Interim Airframe Bulletins) for each model that specifies hydraulic systems contamination inspection and control procedures.
- NAVAIRSYSCOM has issued a bulletin (ISEB 174) for cleanup of GSE, including periodic maintenance requirements.
- All GSE has been, or is being, modified to provide three micron filtration. (Note: 40 microns is the smallest particle the naked eye can see.) Improved GSE is planned for procurement.
- Three micron reservoir servicing equipment (LOE H-250) is being procured and has been partially distributed to fleet units (A-6 and F-4 communities). This equipment replaces funnels, bottles, cans, farm buckets, etc.
- Various pieces of technical data are being revised separately and/or as a result of interim bulletins.
- Various design changes are in preparation, including requirements for better fluids and conversion to three micron absolute filtration in the aircraft. We presently filter in the 10 to 15 micron range.
- Educational programs are being developed by NAVAIRSYSCOM, NATTC and the Naval Safety Center to aid in overcoming the contamination problem.

In summary, an effective contamination control program has been launched by NAVAIRSYSCOM. *Remember, if you can see foreign matter during hydraulic systems maintenance the system is in danger of immediate catastrophic failure*. You might look for properly capped and/or open components, lines, fittings and hoses, in the shop, in transit and on the aircraft/GSE during hydraulic systems maintenance. *Our shops must be clean and we must insure protection from contamination at all times. Cannibalization must be strictly controlled to insure we do not break into systems unnecessarily*. When we do this we invite contamination. Our modern hydraulic systems cannot even tolerate the invisible, much less the visible contaminants. This requires an entirely different attitude, similar in approach to the manned spacecraft program or a hospital operating room. In years to come, an inspecting party will have to wash up like a surgeon before being allowed in a hydraulic clean room. To assure this change in attitude at the operating level will require our continual support of this program. ◄

The Watcher

You watch the guy who flies ahead,
And watch the guy who flies behind.
You watch to the left, you watch to the right.
You fly with a calm, clear mind.
But the guy you really have to watch
On the airway, you will find,
Is the guy behind the guy ahead,
And ahead of the guy behind.

FLYING SHRAPNEL

A PLANE commander and copilot of a West Coast EC-121K squadron were lounging in the readyroom over cups of coffee. Their flight wasn't due to get airborne for a couple of hours, so the usual prebriefing atmosphere prevailed. After finishing their coffee and a game of acey-deucey, our two stalwart birdmen briefed the mission and proceeded to the operations building to file.

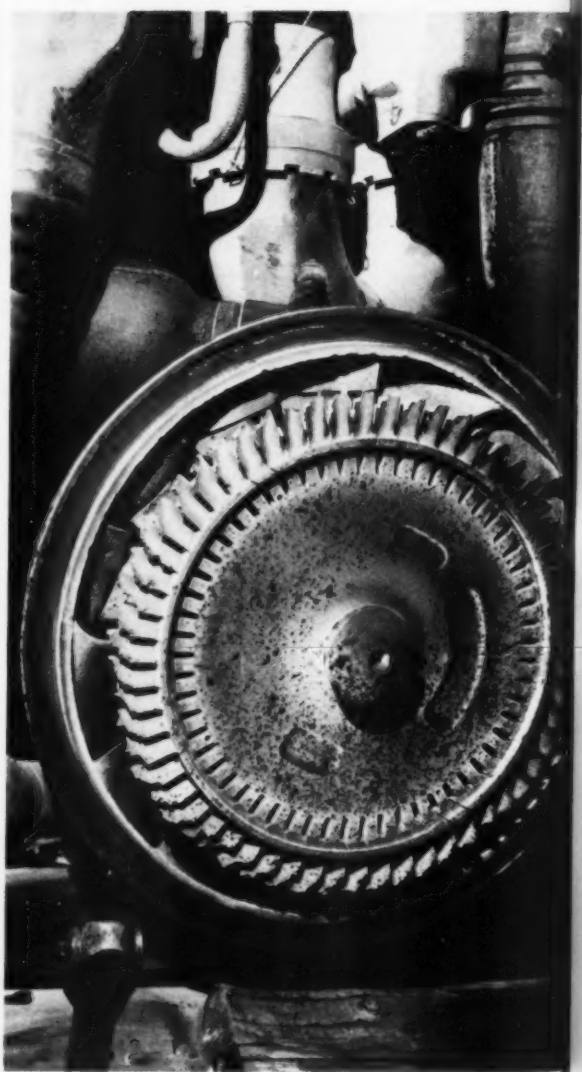
Weather at NAS West Coast was reported 1000 feet scattered, 1500 feet broken and 2000 feet overcast, with tops from 10,000-20,000 feet. Since this was a priority flight the pilot decided to go, figuring he could level off at 10,000 feet and remain clear of the higher build-ups.

The two pilots headed back to their flight line and filled out the yellow sheet. They then proceeded to their plane and conducted a thorough preflight inspection. Confident that there were no gripes, the pilots climbed aboard the bird, took their respective positions in the cockpit, strapped in and went over the prestart checklist. Engines were started and the plane was cleared for taxi to the duty runway. The takeoff checklist was then completed and the pilot requested and received takeoff clearance.

Takeoff was normal in all respects and the airplane commenced climbout at METO* power in low blower at 170 kias. At about 2300 feet the plane entered the soup and broke out at 13,500 feet. Mission requirements called for a more northerly position, which just happened to be in the area of higher build-ups. The plane was turned to a heading of 360 degrees, blower shifted to high and the climb was continued, at METO power, to an altitude of 20,000 feet.

At this point in the flight things began to get real wormy. A BMEP fluctation was observed on No. 3 engine, followed quickly by a fire warning light. No. 3 prop was feathered and a descent was commenced to

*METO (maximum except for takeoff) power is a term used by pilots of C-121s and certain other transport aircraft. It is defined as normal rated power in the NATOPS Flight Manuals for these aircraft.



Failed No. 1 PRT, No. 2 engine.

home base. After a normal GCA and at an altitude of 500 feet, the end of the runway was sighted one-half mile ahead. MAP was increased from 27 inches to 34 inches. At this time the Tower reported smoke trailing from the No. 4 engine.

The pilot continued his approach and landed successfully. After touchdown, flames were detected in the cowling area and No. 4 prop was feathered. The HRD fire extinguishing system was discharged with no effective results. On the landing rollout, Tower reported a fire in the area of No. 2 engine. This fire was quickly extinguished by adding 500 rpm and blowing it out. It took about five minutes for the crash crew to put out the fire in the No. 4 engine.

Subsequent investigation revealed that the No. 2 PRT (Power Recovery Turbine) on both No. 4 and No. 3 engines had failed. The No. 1 PRT on No. 2 engine also failed and the PRT turbine on No. 3 engine had disintegrated, causing shrapnel damage to the wing section. The most probable cause of the PRT failures was determined to be overheating due to the extended climb to a higher altitude using METO power in high blower.

As can be seen by the photos, those shrapnel holes don't look a heck of a lot different than the ones you might get on a low pass over a Viet Cong gun position. In this case, however, the airplane could have ended up shooting itself down.

Since this was the second occurrence of serious PRT failure in a short period, several changes were made in the climb procedures to be used by pilots in this squadron. Mission planning is now accomplished to preclude the need for extensive METO power climbs, except when required for safety of flight or military necessity. Aircraft will level off at minimum enroute altitude or approximately 8000 feet (whichever is the higher) and cruise for a minimum of one half hour before further climbing to a higher altitude. This should provide sufficient cooling of the PRTs and allow sufficient reduction of aircraft gross weight. In addition, a NATOPS Flight Manual change recommendation in the form of a warning has been approved and may be found in Section I, page 1-155 and Section XI, page 11-69. It reads as follows:

WARNING

During high blower operations above 10,000 feet, alternate climb power should be used when making long, continuous climbs. Use of normal rated climb power in high blower above 10,000 feet should be limited to operational necessity or emergency situations to avoid power recovery turbine overheating and possible failure.

Shrapnel damage on leading edge of wing.

Shrapnel damage on bottom side of wing.

This is the No. 2 PRT, No. 3 engine that failed and caused the havoc.

The two lads who flew the flight we have recounted should consider themselves mighty lucky that they landed their bird in one piece. Odds are they won't let something like this happen to them again.

Processionary Caterpillars

Processionary caterpillars feed upon pine needles. They move through the trees in a long procession, one leading and the others following – each with his eyes half closed and his head snugly fitted against the rear extremity of his predecessor.

Jean Henri Fabre, the great French naturalist, after patiently experimenting with a group of the caterpillars, finally enticed them to the rim of a large flower pot. He succeeded in getting the first one connected up with the last one, thus forming a complete circle, which started moving around in a procession, with neither beginning nor end.

The naturalist expected that after a while they would catch on to the joke, get tired of their useless march, and start off in some new direction.

But not so!

Through sheer force of habit, the living, creeping circle kept moving around the rim of the pot – around and around, keeping the same relentless pace for seven days and seven nights – and would doubtless have continued longer had it not been for sheer exhaustion and ultimate starvation.

Incidentally, an ample supply of food was close at hand and plainly visible, but it was outside the range of the circle so they continued along the beaten path.

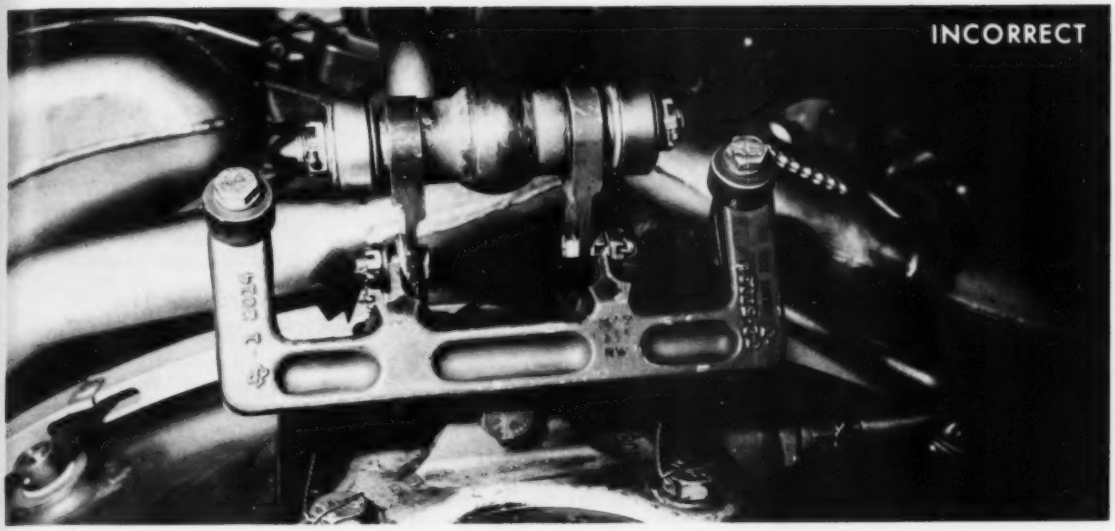
They were following instinct, habit, custom, tradition, precedent, past experience, standard practice, or whatever you may choose to call it, but they were following it blindly.

They mistook activity for accomplishment. They meant well, but got no place.

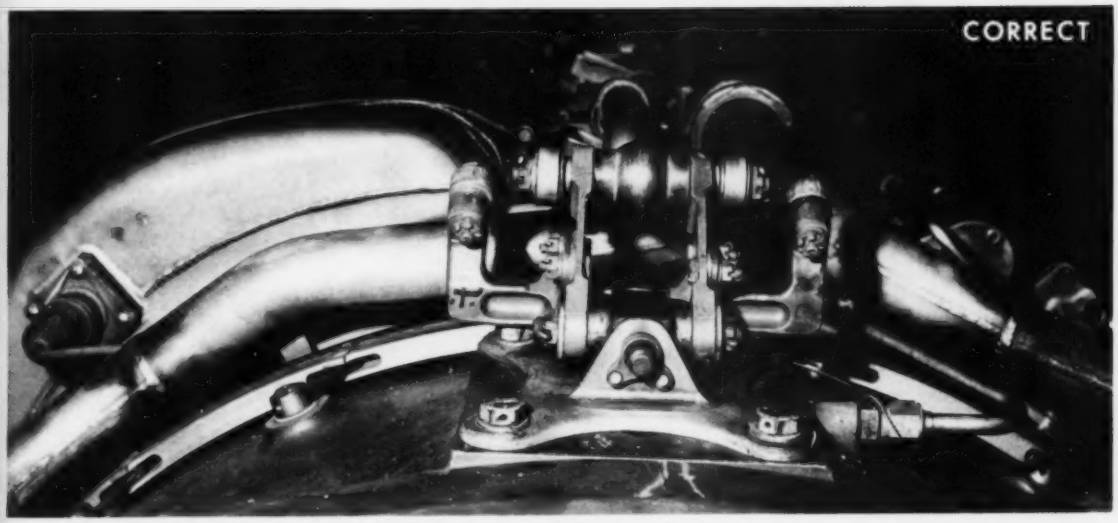
Do you have a goal?


TRADITION

MURPHY'S LAW *



It's a bum "Yoke" when the Mount ain't right.



ON THIS J79-GE-10 engine, the top front engine mount was broken at the connection to the front mount link assembly (P/N 32-50034-16) at the top bolt on both sides of the mount. The yoke (P/N 32-50194-3) had been installed backwards and cracked when landing impact caused the mount to straighten out and bind against the upper forward aircraft mount assembly (P/N 32-511551-3).

These photos indicate both the correct and incorrect installations for this mount. The incorrect installation shows where the failure of the yoke occurred. (Note: The correct installation still requires proper lockwiring.)

* If an aircraft part can be installed incorrectly, someone will install it that way!

LETTERS

A negative mind is man's best alibi for being a loser.
Ace L.

Destroyer Rescues

Washington, D. C. – I read the article, "Night Ditching," involving the rescue of an S-2 crew in the June issue of APPROACH with great interest. The pilot describes having to climb a "scramble net" to get aboard the rescue destroyer. He states, "This net – difficult to climb under normal conditions – was a hairy experience for us at this time."

My experience as a pilot in two separate H-34 ditchings bears out the difficulty of climbing such a net. I'm surprised they managed to climb it at all. In my first ditching, the rescue destroyer expected us to climb a net from our PR-2 liferafts. The sonar operator (after only 20 minutes in 75^{0}F) managed to get halfway up the net before becoming totally exhausted. As the ship rolled . . . he was alternately suspended out over the water then banged full force against the hull. An enterprising first class boatswains mate, seeing that the crewman couldn't make it any further and was in danger of being lost, dropped a Jacobs ladder over the side and jumped into the water to assist. He helped the crewman hook a leg into one rung of the ladder and then the destroyer crew effortlessly pulled the ladder and the exhausted, clinging helo crewman aboard. I watched the event with great interest (while drifting toward the DD's screws) and the recovery of my copilot in the same manner until it was my turn to be brought aboard also by the Jacob's ladder.

After my second ditching I briefed the crew, in the water, to request the destroyer to use a Jacob's ladder. The three of us, clinging to a single one-man liferaft, were quickly recovered with no difficulty. As I recall, both AARs recommended the use of Jacob's ladders or the issuance of helo rescue slings to destroyers for the retrieval of downed aircrewmen.

The recurrence of this kind of incident, coupled with a letter to Anymouse from Shipmouse in the same issue, seems to indicate a need for crossfeed between black and brown shoes regarding safety and SAR.

LCDR Franklin B. Osgood
NAVAIRSYSCOM

• Your letter makes several good points. It's one thing to have drills (usually in calm seas, in daylight and with little exposure time involved) and quite another thing for the "real McCoy" at night in rough seas. In an effort to spread the gospel we are publishing your letter here and in FATHOM and will pass it along to the Canadian Forces Headquarters Directorate of Flight Safety, to whom we are indebted for the article, "Night Ditching."

Why Don't They . . .

NAS Chase Field – This suggestion is not the result of any incident or mishap but could be of great assistance in shore based night operations. Why not install reflecting ridges on taxi lane centerlines? These ridges, which are found on many freeways in California, may prevent the need for excessive use of the taxi light and make night operations a little safer. Perhaps close grouping of them (like a cross) could signify a cross taxiway or a turn point into a line area.

LTJG Ted Furlong
VT-25

• Information indicates that several ideas along the line that you suggested are being investigated. One is to use luminescent paint, another is to use reflector tape as well as the use of reflector ridges. We're happy to pass along your good idea.

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request.

Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, Va. 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

A New Use For The Oxygen Mask

NAS North Island – The article, "A New Use For The Oxygen Mask," in the July '70 issue of APPROACH was very interesting; however, the idea is anything but new and the statement, "the SPH-3B does not have fittings for a mask" is not correct.

I joined the HS community in 1965 and at that time an oxygen mask was a part of the SAR/Utility kit in the helicopter. (This mask was configured basically the same as you pointed out in the article.) The rubber of the mask and elastic headband had deteriorated to the point that they were not usable – indicating extreme age. In October 1967, I acquired an oxygen mask of my own and adapted it to my APH-6. Later, after SPH-3 evaluations, I found it very easy to readapt the mask for this use. I used this configuration during many hours of utility operations as well as SAR and Apollo 8 recovery. While I was working with NASA on the problems of biological isolation, prior to Apollo 11, the configuration of my oxygen mask was suggested and accepted for use during Apollo 11 recovery.

The adaption of the standard oxygen mask with dynamic mike installed is quite simple. It only requires the fabrication and installation of four pieces of nylon webbing three to five inches long, with snaps on the ends.

I have submitted four beneficial suggestions (no reply in over two years) and due to an apparent lack of interest I will take another course of action to disseminate this information. The specifications for this adaption have been given to many individuals and I'll be glad to make them available to

anyone else who may be interested.

AWC N. L. Wood
FAETUPAC

• Whenever APPROACH writes up an idea there is no way to determine whether it is original and we make no claims of any kind for the one who contributes the information. We're glad to publish your letter, Chief, because we believe that by a constant flow of ideas and information from you gents in the fleet that just about any kind of mousetrap can be improved. It would seem from your letter that sometimes the wheels of progress grind very slowly in the beneficial suggestion program. Further research into this problem is being conducted.

Water Training

Point Mugu, Calif. – In regard to LTJG R. L. Schaal's letter on water training (June 1970 APPROACH), our flight personnel must attend a lecture on all aspects of survival, successfully complete a Class "A" maintenance swim and a water survival checkout which consists of a simulated parachute drag, vest inflation, boarding a liferaft and getting out from underneath a canopy.

Our students are fully clothed to conform with their particular aircraft, wearing standard harness, torso harness, flotation equipment, helmet, boots, flight suit and pararaft kit as appropriate. Each student must demonstrate his ability to release himself from his chute while being dragged, to inflate vest orally and to board a PK-2. In addition to the above, he must also demonstrate his ability to get out from under a canopy and rid himself of tangled shroudlines. Shroudline disentanglement training has been well received by all flight personnel. We recommend this procedure to all agencies which have a survival training curriculum.

I hope our training may save a few lives someday.

PR2 Richard A. Webber

• Looks great from where we sit. Everybody in the pool!

The Safety Center has forwarded your material to Chief of Naval Operations (OP-56) for possible use in developing a standardized water survival training syllabus for all flight personnel.

Kind Hearts and Kudos

Pensacola, Fla. – I thoroughly enjoyed the August, 1970 edition of APPROACH. In particular the article entitled "A Single-Engine Bird," by LT Harry Oxenhandler, MC, USN, succinctly summarizes some of the latest preventive medical approaches concerning coronary heart disease.

Dr. Oxenhandler's comment about consulting a doctor before embarking on any dietary/exercise program is well taken. Flight surgeons in the past have encountered aviation personnel who had embarked on medication, diet or exercise programs unsupervised, with impairment of physical conditioning which jeopardized aviation safety. For those semi-sedentary types who wish to achieve better health, seek out your friendly flight surgeon and follow his recommendations!

CAPT Elihu York, MC, USN
Naval Aerospace Medical Institute
Naval Aerospace Medical Center

• Thank you for the good words and for reinforcing Dr. Oxenhandler's point about obtaining medical advice before taking on a program of diet or exercise.

Vol. 16 **approach** No. 5

RADM W. N. Leonard
Commander, Naval Safety Center

Our product is safety, our process is education and our profit is measured in the preservation of lives and equipment and increased mission readiness.

Contents

Departments

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Credits

Making its first appearance on the APPROACH cover is Blake Rader's painting of the Navy's reliable T-28 once again demonstrating the stability Naval Flight Students know and respect. **Pg 11** APPROACH Diagrams by Don Lips. **Pg 26-31** APPROACH Photos by PH1 Ron Bartell. **OBC** Photo courtesy Norfolk Museum, Norfolk, Va.

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VR-1A3 (NARTU Washington)

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**VMGR-252

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and patience!